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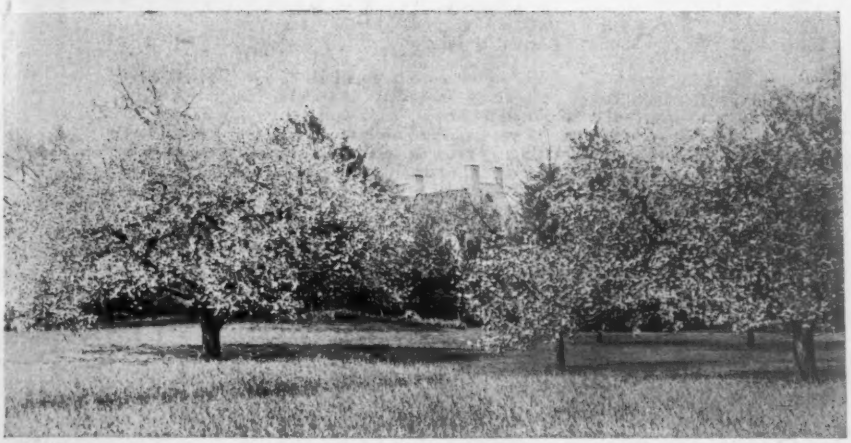
THE CORNELL COUNTRYMAN



"HAVE YOU SEEN AN APPLE ORCHARD
IN THE SPRING? IN THE SPRING?
AN ENGLISH APPLE ORCHARD
IN THE SPRING?
WHEN THE SPREADING TREES ARE HOARY
WITH THEIR WEALTH OF PROMISED GLORY
AND THE MAVIS SINGS ITS STORY
IN THE SPRING.

HAVE YOU PLUCKED THE APPLE BLOSSOMS
IN THE SPRING? IN THE SPRING?
AND CAUGHT THEIR SUBTLE ODOR
IN THE SPRING?
PINK BUDS POUTING AT THE LIGHT
CRUMPLED PETALS BABY WHITE,
JUST TO TOUCH THEM A DELIGHT
IN THE SPRING.

HAVE YOU WALKED BENEATH THE BLOSSOMS
IN THE SPRING? IN THE SPRING?
BENEATH THE APPLE BLOSSOMS
IN THE SPRING?
WHEN THE PINK CASCADES ARE FALLING
INTO SILVER BROOKLETS BRAWLING
AND THE CUCKOO BIRD IS CALLING
IN THE SPRING.

IF YOU HAVE NOT, THEN YOU KNOW NOT
IN THE SPRING, IN THE SPRING,
HALF THE COLOR, BEAUTY, WONDER
OF THE SPRING,
NO SWEET SIGHT CAN I REMEMBER
HALF SO PRECIOUS, HALF SO TENDER
AS THE APPLE BLOSSOMS RENDER
IN THE SPRING."

HORTICULTURAL NUMBER

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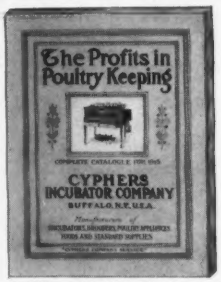

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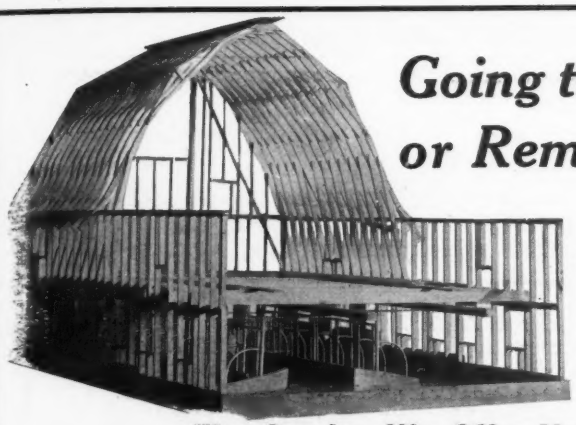

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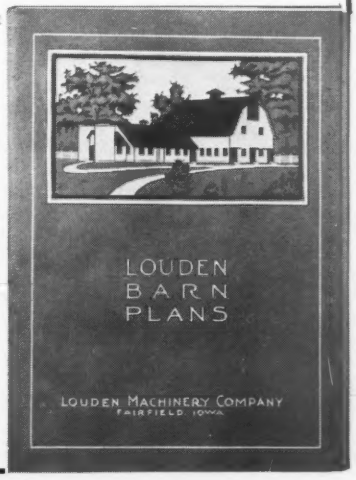

February 1915

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THE CORNELL COUNTRYMAN

Vol. XII FEBRUARY, 1915 No. 5

FRUIT-GROWING AS A BUSINESS

By M. C. Burritt, '08

State Director of Farm Bureaus of New York State

RIGHT or wrong, the average person about to choose a type of farming is influenced to a considerable degree by his personal likes and dislikes, and by his own preconceived notions and by what he believes or prefers to believe are the facts.

To one who has had occasion to answer many inquiries of city men and farmers as to the best kind of farming for a particular locality, a preference for fruit growing usually meaning apple growing is apparent. It is the proper thing in farming. If "everybody is not doing it", "everybody" wants to do it. Two reasons lie behind this choice: (1) The belief that apple growing is a short road to comparative wealth, and (2) the notion that it is an easy occupation and a sort of idyllic life. While there is just enough of fact in these suppositions to lend them credence both are false assumptions.

Large Profits a Myth. Many of the large profits in apple growing are purely mythical, while a good percentage of the remainder are so stated as to be grossly misleading. This is why the proneness of humanity to believe what it wants to believe proves disappointing in so many cases.

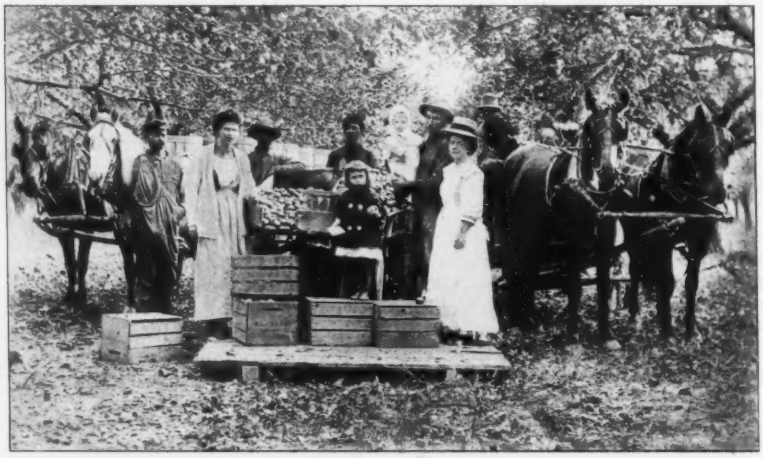
Laying aside the mythical and untrue stories of profits in apple growing which investigation always shows to be unworthy of belief—and the wise investor will always investigate suspiciously large stories of profits—there are some good reasons why uninformed persons are often misled even by statements of facts. Professor Warren has well pointed out that there are periods of under and over production with nearly all crops and that the longer the time required to grow a product the worse these periods become. This means times of high and low prices. We have just experienced a high price period in apples. Profits in apple orcharding have been judged by those in this period. Natural American optimism has done the rest and we are just closing a period of very heavy apple tree planting. A similar period was that between 1855-1875. It was followed when the trees came into bearing by a period of about twenty years of extremely low prices which was accompanied by a practical cessation of apple planting.

During this period of depression in the apple business, there was also a marked neglect of the care of bearing orchards, when the products of thousands of trees were unmarketed. This led to neglect and the destruction of trees and even whole orchards by insect pests and diseases, the chief of which were the army worm and the San Jose Scale. The enormous crop of 1896 was the climax of this period and led to the cutting down of some apple orchards. The withdrawal of

so many old bearing trees, especially in those sections where fruit-growing was not the primary business had its effect in a considerably lessened supply. Moreover, the great crop of 1896, also had a favorable aspect for it forced apples into markets which had not heretofore known them commercially. Almost simultaneously came the practical application of the cold storage and the refrigerator car, permitting the distribution of the crop over a longer season. The more systematic development of the business and of advertising apples has also had its effect.

In undertaking apple growing as a business these facts should be kept in mind. In estimating probable returns too, the average of a long period of years should be taken rather than one big crop year or even a ten year average in a mature orchard. We hear stories of yields of 15 and 20 barrels per tree, but few ever heard of 400 and 600 barrels an acre. But the facts remain that the average yields in Western New York, for example, are not over six to eight bushels per tree or 70 to 90 barrels per acre. These figures represent the probabilities which the conservative grower will figure on. The radicals will, of course, gamble on the possibilities, but 95% of them will probably loose.

Let me give you one other example of a misleading method of figuring profits. Suppose that one grower does realize a net profit of $500 an acre in one year, as may happen once in ten years in exceptional orchards. This is far from an average, because he undoubtedly had almost a total failure another year. It is improbable that an average well cared for orchard will return more than $100 an acre annual net profit even in the last ten years period of high prices. If this is true it is improbable that such an orchard averaged more than $50 an acre profit in the preceding twenty year period of low prices. Assuming that the orchard is forty-five years old and in its prime and remembering that such an orchard made no profitable returns under twenty years of age, we have an average annual profit for its life time of about $45 an acre which is somewhere near a reasonable expectation for orchards of good varieties properly cared for, and advantageously marketed. Against this estimate we must offset thousands of



ORCHARD OF JAS. CRAMER, MIDDLEPORT, N. Y.

trees of poor or unadapted varieties, improperly cared for and disadvantageously marketed which usually result in a heavy loss or at best a very small profit.

Fruit-growing as an Occupation. Few will deny that the life of the fruit-grower has not many advantages over that of other farmers, as the dairyman for example. The work is less constantly exacting, the days are shorter there being fewer "chores" to do, it is less confining allowing him to get away more frequently and giving him a long rest and vacation period in the winter time. It is true that there are periods when the fruit-grower must be constantly on the watch and at his job, such as in the spraying and in the harvest seasons, but these are comparatively short. Trees differ from cows, not in that they require less care, but in that they require less constant daily attention throughout the year. Live-stock means "chores" morning and night and hence longer hours of work.

Perhaps the characteristic of fruit-growing as a business, which makes the strongest appeal to many people is the period of about three months in the winter when the farmer is free to rest or go to Florida or California, if he can afford it. This is, however, an appeal to the naturally lazy streak in men and to a man's love of pleasure seeking, rather than to his business sense. It is not a good occupation from a business viewpoint which provides only nine months work in twelve.

INTENSIVE FRUIT GROWING IN A REGION DEVOTED PRIMARILY TO THE INDUSTRY—NIAGARA COUNTY

There are few occupations in which persons can make a good years income by working only three-quarters of the year. Instead of being an advantage this period of idleness is really the greatest weakness in the business. In too many cases idle men and horses destroy much of the profits earned during the rest of the year.

Production and Consumption of Fruit. We have considered so far chiefly the disadvantageous factors in the fruit business. I have purposely emphasized these both because they are important and because they are generally given far too little consideration. There is, however, a more encouraging side though this is nearly always featured and over emphasized.

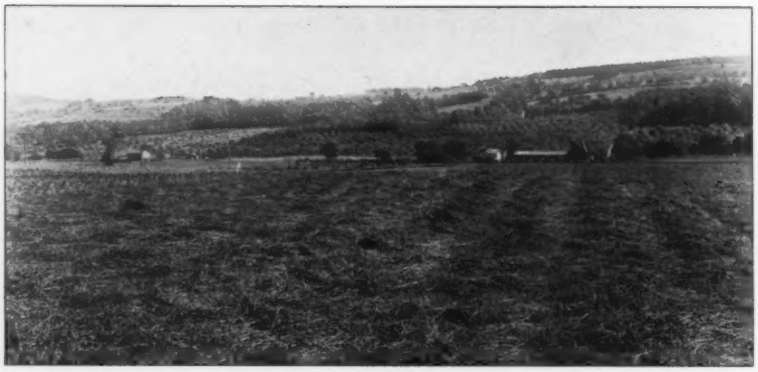
Up to 1910 there was a steady and marked decline in the total yearly United States crop of apples as indicated by the following table:

5	Year	Aver.	1896–1900	Inc.	46,690,200	bbls.
5	"	"	1901–1905	"	37,178,200	"
5	"	"	1906–1910	"	28,582,000	"
4	"	"	1911–1914	"	38,443,750	"

Estimating the 1914 crop at a round 50,000,000 barrels, the average crop of the last four years is practically 10,000,000 barrels greater than the average crop of the previous five years, but still 8,000,000 barrels less than the five year average crop of the 1896–1900 period. There are good reasons for these facts.

In spite of the fact that there were in 1909, 65,792,000 trees not of bearing age, which means practically that at least 50,000,000 trees were planted between 1900–1909, the total number of apple trees increased only a little over 15,000,000 or 9.2 per cent. During the same period the population increased nearly 16,000,000 persons or 21%. In other words the new plantings heavy though they were during this period did not keep pace with the increase in population.

This condition is partly the result of the rapid dying out of old apple orchards in the Eastern States, particularly in sections not devoted primarily to apple growing. To become impressed with the rapidity with which these old orchards are disappearing, as a result of neglect, wind storms, ravages of insects and diseases, poor marketing facilities, and other causes, one has only to observe these sections carefully or examine the census figures. In the great state of Pennsylvania, for example, the number of trees of bearing age declined from 11,774,000 in 1900 to 8,000,000 in 1910. To replace these only 2,501,000 trees were planted leaving a net loss of 1,273,000 trees in the ten years.



WHERE FRUIT-GROWING IS A PART OF A SYSTEM OF GENERAL FARMING—ONONDAGA COUNTY

In New York, the greatest deciduous fruit-growing state in the union, the situation is the same, a loss of 3,807,000 bearing trees replaced by only 2,829,000 trees with a net loss of nearly a 1,000,000 trees. Comparing non-fruit-growing counties with those primarily devoted to the business, we are still more impressed with the rapidity with which the old orchards are going out, and also the tendency to specialize and localize the business of fruit-growing. Ten New York counties in which the growing of apples is not a primary industry, namely: Allegany, Broome, Jefferson, Madison, Delaware, Herkimer, Albany, Nassau, Warren, and Franklin showed a decrease of 31% in the number of bearing trees between 1900 and 1910, while five prominent fruit-growing counties, namely, Niagara, Orleans, Monroe, Wayne and Ontario showed a decrease in bearing trees of only 9%.

Exports and Consumption. Our exports of apples have more than doubled in the last ten years and the increase

has been particularly rapid during the last five years. It is also probable that percapita consumption has increased to some extent particularly in those places where a regular supply is available at a moderate price. Professor H. B. Knapp has shown that the average yearly receipts of apples at New York City during the ten years from 1904 to 1913 were 1,110,000 barrels or 43% greater than in the ten years from 1893 to 1903. It is also to be noted that many new markets have recently been opened up.

It is evident to every one that *there are two sides to the question*. I am not a pessimist about the apple business. On the other hand I am enough an optimist, so that under the right conditions I would not hesitate to add to the twenty-five acres of apple trees, I have already planted and in bearing, but I recognize the limitations in the business.

Summary. Without taking the space to demonstrate the truth of the assertions, as I could do, I will bring this article to a close by pointing out what seem to me to be some of the most important limitations and the opportunities in fruit-growing as a business.

1. The original outlay, the long waiting period to bearing and the constant fight against insects and diseases require large capital and it is extremely inadvisable for a person with small capital to engage in the business. Here and there a man will succeed with a small capital, but the wise man will take averages rather than exceptions as his guide.

2. Location with reference to markets and to other persons engaged in the same business is very important. Here is a limited opportunity to grow apples for local markets near almost every large city in the eastern states. As a general rule, however, prices average much better in regions where apple growing is an important industry, because quantity encourages standardization, attracts buyers and permits cooperative advertizing and selling.

3. The cost of production to a locality or on a particular farm is an important factor in determining profits. As a general rule, and excepting very large fruit plantations where several kinds of fruit are grown, apples can be produced cheaper on the general or diversified farm primarily because of a better distribution of labor which is approximately one-half the cost of apple production. On such a farm twelve years of accurate farm records show that the average cost of growing apples is less than $1.50 a barrel and that in favorable seasons with large crops, this cost sometimes falls as low as $1.00 a barrel. Farms which cannot produce apples at this low cost are disadvantaged accordingly, unless they are able to command a market price above the average which few growers are able to do.

4. Soil is a relatively unimportant factor in apple growing because there are many hundreds of thousands of acres of suitable soils more than will ever be needed for apple production. Adaptation of variety to soil is important. Too much attention cannot be given to climatic factors such as length of the growing season, rainfall, temperature, particularly in winter, as influenced by nearness to bodies of water, exposure to winds, elevation, etc., as these limit profits directly.

EUROPEAN GRAPES IN NEW YORK STATE

U. P. Hedrick, Geneva Experiment Station

EDITOR'S NOTE—Experiments at the Geneva Experiment Station are proving that there are great possibilities for European Grapes in New York State.

I NEED only remind readers of the COUNTRYMAN of the many efforts to grow European grapes in America. The various attempts, some involving individuals, others corporations and in the early days even colonies, form some of the most instructive and dramatic episodes in the history of American agriculture. All endeavors, it will be remembered, were failures, so dismally and pathetically complete that we are wont to think of the 200 years from the first settlements in America to the introduction in 1816 of the Isabella, a native, as time wasted in futile culture of a foreign fruit. The early efforts were far from wasted, however, for out of the tribulations of two centuries of grape-growing came the domestication of our native grapes, one of the most remarkable achievements of agriculture. It is possible, too, that we may find that the failures of the fathers of American viticulture are the foundations for the success of the sons.

The advent of Isabella wholly turned the thoughts of vineyardists from Old World to New World grapes. So completely, indeed, were viticulturists won by the thousand and more native grapes that came trooping in that for the century which followed no one has planted Old World grapes east of the Rockies while vineyards of native species may be found north and south from the Atlantic to the Pacific.

Meanwhile, much new knowledge has come to agriculture, old fallacies have had many hard knocks and chains of tradition in which the culture of plants were bound, have been broken. In no field of agriculture have workers received greater aid from science than in viticulture. Particularly this is true of the diseases of the vine. The reports of the old experimenters were much the same, "a sickness takes hold of the vines and they die". What the sickness was and whether there were preventives or remedies no one knew a hundred years ago. But we have learned something about the ills grape flesh is heir to with preventives and remedies for them. We know that the early vine-growers failed in part at least because they followed empirical European practices. Is it not possible that in the last hundred years we have advanced sufficiently in our knowledge of the vine and of soils and insects and fungi that we can now grow *Vitis vinifera* in eastern America where the old experimenters failed? The Geneva Experiment Station is putting this question to test with what result I am now to tell.

In the spring of 1911, the Station obtained cuttings of 101 varieties of European grapes from the United States Department of Agriculture and the University of California. The object was to obtain European varieties to hybridize with American grapes. I hasten to say that at first there was no thought nor plan to experiment with these grapes as a cultivated crop. The cuttings obtained were grafted on the roots of a heterogeneous collection of seedlings five years set representing a half dozen species of Vitis and hybrids between them then growing on the Station grounds. These stocks had little to recommend them except that all were vigorous, well established and all were more immune to phylloxera than the Old World varieties. From four to six grafts of each of the hundred varieties were made and a stand of 380 vines resulted, the percentage of loss being exceedingly small. The success in grafting we believe to be due to the method used, one the value of which had been proved in previous work on the Station grounds.

In grafting the earth was removed from plants to be grafted to the depth of two or three inches. The vines

were sawed squarely off below the surface of the ground. The stock was then split for a cleft graft. Two cions were inserted in each cleft and tied in place with waxed string. Grafting wax was not used, the wax being worse than useless because of the bleeding of the wounds in the stock. The earth was then replaced and enough more of it used to cover stock and cion to prevent evaporation from the plant. This method of grafting is available to those who have old vineyards. It is so simple that the veriest tyro can thus graft grapes. Were young plants or cuttings used as stocks some method of bench-grafting would, of course, be resorted to.

FRUITING VINES OF VITIS VINIFERA AT THE GROUNDS OF THE GENEVA EXPERIMENT STATION

The cultivation and spraying has been precisely that given native grapes. There has been no codling of vines. The fungous diseases which helped to destroy the vineyards and vexed the souls of the old experimenters have been kept well in check by two sprayings with bordeaux mixture; the first application was made just after the fruit set, the second when the grapes were two-thirds grown. Last year, 1914, a third spraying with a tobacco concoction kept thrips in check. Phylloxera is present in the vineyard but no one of the varieties on the resistant roots are appreciably suffering from this pest. It need hardly be said that the immunity to phylloxera secured by grafting is the chief reason for the success we are having with these grapes—undoubtedly this pest was the chief cause of the early failures. The stocks used in the present work are not those best suited either to the vines grafted on them or to resist phylloxera. Unquestionably some of the standard sorts used in France and California from *Vitis rupestris* or *Vitis riparia*, or hybrids of these species, would have given better results. From theoretical consideration it would seem that the Riparia stocks should be best suited to the needs of eastern America.

It was thought by the old experimenters that *Vitis vinifera* failed in the New World because of unfavorable climatic conditions. It was said that the winters were too cold and the

summers too hot and dry for this grape. During the few years the Station vineyard of Viniferas has been in existence we have had stresses of all kinds of weather to which the variable climate of New York is subject. Two winters have been exceedingly cold, killing peach and pear trees; one summer gave us the hottest weather and the hottest day in twenty-years; the vines withstood two severe drouths and one cold, wet summer. These test seasons have proved that European grapes will stand our climate as well as the native varieties except in the matter of cold—they must have winter protection.

To growers of American grapes the extra work of winter protection seems to be an insuperable obstacle. The experience of several seasons at Geneva shows that winter protection is a cheap and simple matter. Two methods have been used; vines have been covered with earth and others wrapped with straw. The earth covering is the cheaper method and the more efficient. The vines are pruned and placed full length on the ground and covered with a few inches of earth. The cost of winter protection will run from two to three cents per vine. Since the European vines are much more productive than those of the American grapes the added cost of winter protection will be much more than offset by the greater yield of grapes. Trellising, too, is simpler and less expensive for the European grapes, helping further to offset the cost of winter protection.

It is apparent at once that European grapes must have special treatment in pruning if they are to be annually laid on the ground. Several modifications of European and California practices can be used in the East to bring the plants in conditions for winter laying-down. All methods of pruning must have this in common; new wood must be brought up from the base of the plant every second, third, fourth or fifth year in order to permit the bending of the plant. In our experiences we have no difficulties in so training the vines. Briefly, we have maintained for each vine two trunks, one old, the other young, which we have carried up to or just below the first wire in a two wire trellis system and from each of these trunks we have laid off a cane to right and left on a lower wire each bearing from four to eight buds. The bearing shoots that grow from the buds on these canes are tied to the second wire. In a commercial vineyard, depending upon the varieties, our simple method might be modified in many ways to meet conditions.

The grower of European grapes grafted on American vines may be prepared to be surprised at the growth the vines make. At the end of the first season the grafts attain the magnitude of full-sized vines; the second season they begin to fruit more or less abundantly and the third year they produce approximately the same number of bunches as a Concord or Niagara vine and as the bunches of most varieties are larger than those of the American grapes the yield, therefore, is greater, the European varieties too, may be set more closely than the American sorts since they are seldom such rampant growers.

It is quite too soon to reason from this short experiment that we are to grow varieties of *Vitis vinifera* commonly in New York but the behavior of the vines on the Station grounds seems to indicate plainly that we may do so. At Geneva the European varieties are as vigorous and thrifty as American vines and quite as easily managed. Why may we not grow these grapes if we protect them from phylloxera, fungi and cold? In Europe there are varieties of grapes for nearly every soil and condition in the southern half of the Continent. In Eastern Europe and Western Asia the vines must be protected just as we shall have to protect them here. It seems almost certain that from the many sorts selected to meet the various conditions of Europe we shall be able to find kinds to meet the diverse

soils and climates of this continent. And here, by the way, we have one of the chief reasons for wishing to grow these grapes—that American grape-growing may not be so localized as it now is. Probably we shall find that European grapes can be grown in more kinds of soils and under more various conditions than are our natives.

The culture of *Vitis vinifera* in the East gives us essentially a new fruit. If any considerable degree of success attends their culture wine-making in Eastern America will be revolutionized for the European grapes are far superior to the native sorts for this purpose. Varieties of *Vitis vinifera* have a higher sugar and solid content than do those of the American species and for this reason as a rule keep longer and we may thus expect that through these grapes the season for this fruit will be extended. The European varieties are better flavored, possessing a more delicate and a richer vinous flavor, a more agreeable aroma, and are lacking in the acidity and somewhat obnoxious foxy taste of many American grapes. Consumers of fruit will like them better and the demand for grapes will thus be increased.

The advent of the European grape in the vineyards of Eastern America ought quickly to bring about splendid varieties of hybrids between *Vitis vinifera* and the American species of grapes. As all know, we have many such hybrids but curiously enough scarcely more than a half dozen varieties of European grapes have been used in crossing. Most of these have been greenhouse grapes and not those that could be expected to give best results for vineyard culture. As we come to know the varieties best adapted to American conditions we ought to be able to select European parents to better advantage than we have done in the past and thus produce better hybrid sorts.

From the 85 varieties of *Vitis vinifera* now fruiting on the Station grounds we may name the following as worth trying on a larger scale: Actonia, a table grape; Chasselas Golden for the table; Cinsaut for table or wine; Feher Szagos another table sort; Kuristi Mici for the table; Lignan Blanc a very early table grape and one of the best; Mantuo de Pilas, Muscat Hamburg, Pinot Gris or Rulander three of the best table grapes; Poulsard a wine and table grape; Palomino or Listan a table and wine grape; Rosaki a table grape; Sultanian Rosea, a seedless table sort; and Teinturier, Petit Syrah, Franken Riesling and Zinfandel, all wine sorts.

I have briefly set forth the essentials of the work with *Vitis vinifera* in New York but I shall have missed an opportunity if this simple statement of facts ends here. Permit me to suggest several phases of the work in need of careful experimental attention.

First, it is imperative that we know more about the adaptation of European varieties to American conditions. More than a thousand varieties of grapes are grown in Europe and Asia but few of which have been tried in Eastern America. Those most promising for the different regions should be carefully tried out.

Second, it is very certain that we shall have to grow European grapes on American stocks. We must determine experimentally what stocks are best for eastern America; here the experience of European countries and California will be most helpful.

Third, a great obstacle in the way of growing European grapes in this region is the difficulties in getting a good stand of grafted plants. Possibly we shall have to modify practices elsewhere to determine which we must have experimental work in grafting and propagating.

Fourth, European varieties will be differently effected by fungi and insects than are our native sorts and we shall have to modify remedial treatments of pests for the foreign grapes.

Fifth, there is a tremendous field for plant breeders in hybridizing European and American grapes. The half dozen European sorts that have been used in hybridization are in part those that would be least expected to give good results—greenhouse grapes. It is probable that the American grapes of the future will be European grapes with a dash of American blood in them. Plant breeders have a wonderful opportunity to breed grapes, despite the fact that more work has been done in improving this fruit in the past hundred years than with any other.

THE SOILS OF THE WESTERN NEW YORK FRUIT AND GRAIN REGION

ARTICLE NO. 4

By Elmer O. Fippin

Professor of Soil Technology, New York State College of Agriculture at Cornell University

EDITOR'S NOTE—This is the fourth of the series of articles dealing with the Agriculture of New York State.

THE most prosperous and well developed agricultural part of New York State lies adjacent to Lake Ontario and Lake Erie on the south side within a distance of five to forty miles. Practically all the land is in farms and more than 75 per cent of the area is improved. No where else in the state are there such extensive areas of relatively level land. No where else over so large an area is the elevation so low. No other part of the state has such a diversity of crop interests, or such intensity of crop production on as large a scale. No where else is there such varied soil conditions or such large areas of soil of such high productive capacity. In density of rural population, value of land and extent of transportation facilities by wagon road, steam road, electricity and by water, this region of western New York stands clearly in the lead. It may fairly be termed the flower of New York State's agricultural domain.

Location. The fruit and grain region begins a little east of Syracuse and extends westward to the boundary of the state. From the Great Lakes it extends southward a varying distance. At the east it ceases about ten miles south of Syracuse. In the Finger Lakes region in central New York, it swings further south, especially along the shores of those lakes, forming a loop. In the western part adjacent to Lake Erie it forms a narrow strip of land which is only four or five miles wide. In a general way it is limited on the southern side by the 1000 foot contour of elevation. This forms a waving and sinuous line around the northern front of the southern New York hill lands.

Drainage. The drainage is all northward into the Great Lakes, chiefly by small streams. Only two important rivers traverse the region—the Genesee and the Oswego. The natural drainage is poorly developed as a result of the undulating and flat topography and extensive areas of wet and swamp land have resulted. The Oak Orchard Swamp in the western portion and the Montezuma and Cicero swamps in the eastern part are the most extensive of these. Small swamp and muck areas are numerous.

Physiography. The topography is very diverse. It is made up of two more or less distinct plain areas. Their identity has been largely effaced in the eastern part of the region. These plains are the Ontario Lake plain, best developed west of Roches-

ter, and the Erie Lake plain, best developed west of Batavia and southwest of Buffalo. These two plains are separated by a rather sharp slope. This begins at Lewiston on Niagara river where it is highest and best developed. It extends eastward through Medina to Rochester where its identity is largely lost. The general slope of both plains rises to the southward. East of Rochester the two merge into a broken swell. South of Lake Erie the plain is limited by a steep bluff. This also fades into the foot hills as it extends eastward.

The distinct plains have a slight undulating surface. The remaining area of the region has a decidedly rolling to hilly surface. A considerable part of this hilly land is made up of a peculiar type of hill of a long, rounded, tadpole outline, termed drumlins. These are best developed in Wayne county and eastward to Auburn and Syracuse. Westward they fade out in the region of Lockport. Southward they give way to a more general surface swell. These drumlin hills have their long axes in a general north and south direction, but arranged somewhat on the radii of a circle whose center is near the northeastern shore of Lake Ontario.

There are two distinct belts of low and relatively flat country extending east and west. The first, on the north, is occupied by the Erie Canal and the New York Central Railroad. The second extends from Buffalo eastward by Rochester, Jamestown, Geneva and Auburn. Both are extensive thoroughfares of travel. The elevation on the Ontario plain is 300-500 feet. On the Erie plain it is 600-900 feet. In the southern foothills it is 800-1200 feet. In the Finger Lakes region the surface rises rather steeply from the lake shores to the highland ridges that belong to the southern New York province and have an elevation from one to two thousand feet or more in height.

BEANS ON DUNKIRK CLAY, DOTY FARM, GENESEE BASIN; LOT DRAINED BY H. E. COX IN 1907; IN DISTANCE, BEARING CORN

Climate. The climate has no very distinct features except the modification due to the Great Lakes which is perceptible only two or three miles inland. The prevailing wind is westerly. The annual rainfall is low relative to the state. In the region of Buffalo and Lockport the summer rainfall is the smallest in the state.

Soil Conditions. The diversity and productive capacity of the soils which are the basis of the high agricultural development of the region are the result of a combination of processes. Chief of these are the nature and

position of the underlying rock strata and the influence of glaciation.

The soils range from heavy stratified clay to loose sand and gravel. They range from those free from stone to those strewn thick with large and small boulders and rock. They range from soils where there is scarcely enough earth to cover the rock to drift a hundred feet or more in thickness. A large part of the land is notably calcareous, especially in the subsoil, and this is a large factor in its productiveness. In general the stock of organic matter is fairly good but requires attention.

The first step in glaciation was the advance of the continental ice sheet from the north over this region. It attained great depth and left as a ground morain a fairly deep but irregular sheet of till. It has been suggested that the drumlin hills may represent either unequal deposition beneath the slow-moving ice mass, much as sand bars are formed in streams, or they may represent the readvance of the ice over a deep deposit and unequal erosion of the old material.

Wherever the till is deep and especially to the southward of the limestone

VINEYARD EAST OF SILVER CREEK, CHIEFLY CLAY SOIL IN VIEW, RIDGES OF GRAVEL

Geology. The underlying rock consists of a succession of blue, red and gray sandstone and limestone strata that have a moderate dip to the south (See map by Von Englen, Cornell Countryman, October, 1914, pp. 19.) The outcropping edges of these strata extend from east to west. Limestone formations occur in two strips. One by Lockport and Rochester and thence to Syracuse. The other by Buffalo, LeRoy, Geneva and Auburn. The occurrence and position of these calcareous formations should be kept in mind as an aid in interpreting the character of the soils.

outcrops, the glacial till is very calcareous. In the surface soil the lime content may now be low due to leaching. South of the last limestone outcrop the lime in the subsoil gradually decreases in amount and retreats deeper into the subsoil. The region merges very gradually with the highland region to the southward. The calcareous till extends much further south in the valleys than over the hills.

During the retreat of the glacial ice the great volume of water resulting therefrom was imponded between the front of the ice and the height of

land to the southward. Consequently, as the ice front retreated these marginal lakes extended in area and dropped in level as lower and lower outlets were available. In the latter stages they extended somewhat continuously across the state and at one time the entire area had an outlet eastward through the Mohawk valley.

The prevailing soil is a heavy loam to a clay loam. There are extensive areas of silt loam and several small areas of drifting sand. Gravel deposits are widely distributed.

Nearly all the hollows between the hills, the important plain areas, and the shores of the Finger Lakes were covered by glacial and lake stream deposits. Consequently they are occupied by a series of gravelly, sandy, silty and clayey soils. This variation represents the range from swiftly flowing streams to quiet lake water.

These deposits which are stratified, are more or less calcareous, especially in the subsoil since they are the wash from the higher lying calcareous till soils.

Classification of Soils. As a result of the geological conditions outlined above, seven important series of soil have been developed. Two of these are of glacial till origin. Four are of lake and swamp derivation and one is made up of recent stream deposits. There are several other series of minor extent.

Glacial Soils. The two glacial till series are the Ontario and the Honeoye, and are distinguished primarily by their content of lime carbonate and the depth of material.

Ontario Series. The Ontario series is the most extensively developed of any in the region. It includes the drumlin areas and rolling hill land that rises to the southern New York highland. The material is deep and moderately calcareous. There is usually sufficient lime carbonate at a depth of three feet to effervesce freely with acid. Above that depth its presenceis uncertain and it is seldom present in the surface foot except in the form of pebbles and larger stone. The soil is a dark gray to reddish brown color. The subsoil is a dark chocolate-brown to dark gray or bluish color. A pink tinge is imparted by the presence of red shale and sandstone material from formations on the Ontario plain, and they increase in amount from the south to the north. The series does not occur west of Buffalo.

There are two predominant types in the series, the loam and the fine sandy loam and both are extensively developed. They have a very similar relation to the chief crops of the region. The fine sandy loam is slightly warmer and produces a somewhat more rapid growth. Its drainage is slightly better than the loam type. Both soils are variable in nature within the section. In addition to the unstratified till that forms much of the section there is likely to be a lenticular structure made of thin bands of clay, silt, sand, and gravel of small extent. These form small pockets and indicate reworking by water. It is rather more noticeable in the fine sandy loam than in the loam type. The heavier layers, together with the coarser material, develop wet pockets and springy areas that require drainage.

The soils of this series are derived from the shales and sandstones of the region with a large admixture of limestone material from the local formations. Limestone boulders are a feature of the soils. Granite and sandstone boulders are much more abundant than the limestone.

The stone in the soil does not interfere seriously with tillage operations.

All the staple, grain, forage and fruit crops are grown on these soils. The apple orchards are most largely developed on this series which may be designated as the pre-eminent series for apple production in the state. The trees grow to large size, are vigorous and long-lived. Trees a century old may be found. High quality and good flavor are normally secured. Not enough data are available from which to draw any conclusions as to differences between the loam and the fine

sandy loam. In general it is believed the longest lived trees and the best keeping quality and flavor of the standard varieties are secured on the heavier soil when in good physical condition.

Peaches are grown successfully on these soils. Other fruits are also grown successfully but they are grown more extensively on the lighter soils of the Dunkirk series.

Throughout the Ontario series good apple orchards are common. They stretch eastward from the Niagara river into Wayne and the western edge of Oswego county. In fact an area of this series occurs in southern Jefferson county where some apples are grown upon it. The orchards spread southward into Geneseo and the northern half of the second tier of counties from Lake Ontario. This includes Wyoming, Livingston, Ontario, Seneca, Cayuga and Onondaga counties. The apple industry is spreading eastward and southward, keeping pretty much to these soils.

Grapes are not extensively grown on the Ontario soils, although the Niagara grape was produced on the loam type near Lockport.

In addition to the grain, hay and forage crops which are extensively and successfully grown on these soils, two crops should be specially noted. These are beans and cabbage. Their production is largely developed as field crops.

Beans are predominant in the Genesee valley region south of Rochester. They are grown as far west as Buffalo and east to Auburn. On the other hand the production of cabbage is more confined to the southeastern part of the region. Its production while widely distributed is best developed east of the Genesee river near Geneva, Auburn, and south of Syracuse.

The Ontario soils are pre-eminent for the production of alfalfa, and in their best developed parts just below the Ontario escarpment have formed the natural alfalfa country where the crop has long been grown successfully with very little care.

The series is usually marked by thrifty farms, except where it is remote from shipping facilities.

Honeoye Series. The Honeoye series of soils is very much more limited in extent and agricultural importance than the Ontario series. It forms narrow bands closely confined to the outcrop of limestone formations.

The soil formation is thin, often being less than three feet in thickness over limestone. Limestone fragments are abundant in the material. Both soil and subsoil are strongly calcareous and effervesce freely with acid.

The soils are most extensively developed in connection with the exposure of limestone through Leroy, Geneva and eastward by Auburn and central Onondaga county.

The stony loam has been recognized in largest area. The loam and fine sandy loam probably will be more extensively recognized in the eastern portion of the area where it merges with the Farmington series with which it is closely related.

The soil is usually a very dark gray fine sandy loam. The subsoil is dark gray to a light brown color and in the stony type meets ledge limestone at two to three feet in depth. Outcrops of rock are common which makes a pocketed condition of soil. Large and small fragments of limestone are common.

Where the soil is deep—three feet or more—it has a high agricultural value but on the whole the series is much inferior to the Ontario and there and there are no outstanding crop relations.

Lake Formed Soils. The Dunkirk and Westfield series include the glacial lake deposits of the region. The former is characterized by a chocolate brown and pinkish color. The latter by a yellow or light brown color. The Dunkirk series occurs almost entirely east of Buffalo. The Westfield series is developed west of Buffalo. The former is on the whole the better agricultural soil. These lake-formed

soils occupy all the more level areas and the lower-lying portions of the region.

The coarser members of both series found on the shores and as outwash material may ultimately be placed with the Chenango and Adams series. These include the shore beaches, such as the beach on which the ridge road is located from Sodus to Lewiston and from Hamburg to State Line. Near Pittsford in eastern Monroe county is an extensive area of dune sand of very little agricultural value.

Both series are usually calcareous in the subsoil.

Dunkirk Series. The Dunkirk series owes its peculiar character to the red shale and sandstone of the Lockport and Medina formations on the Ontario plain. That color is less distinct to the southward. The types range from heavy clay to light sand and silt. Tree and small fruits are extensively grown on the coarser members of this series. Peaches and cherries are especially identified with the silt and fine sandy loam. The silt loam is the preeminent soil used for nursery stock around Lockport, Rochester and Geneva. Nursery stock is also grown on the clay loam. These soils give rapid growth and the roots can be well preserved in digging for shipment. The clay and clay loam are most used for hay production and timothy meadows may continue to give fair yields for six to eight years.

Grapes are extensively grown on the clay loam soil in the Finger Lakes region and especially along the shores of Seneca and Keuka Lakes. The sandy and gravelly loam are used to a less extent.

Lack of subsoil drainage and bad physical conditions in the heavy types are the most serious handicap.

Westfield Series. The Westfield series includes the light yellow and light brown soils on the Lake Erie plain and along the foot of the Erie escarpment. The types range from heavy clay through silt to sandy and gravelly loam. The heavier soils usually form the sub-structure and the lighter soils are unevenly distributed over their surface. Clay and silt loam of the old lake plain predominate. Sandy loam is common. The beach bars are gravelly and sandy.

From near the mouth of Cattaraugus creek westward the production of grapes is the pre-eminent business and the region is known as the Grape Belt. They are grown on all kinds of soil, including the gravelly and sandy members on the "ridge." Blue

FARM RESIDENCE, FIVE MILES SOUTHEAST OF BROCKPORT, MONROE COUNTY, N. Y.

grapes suited to the manufacture of grape juice largely predominate. The heavier soils when well drained and in good condition give best results and the vineyards are longer lived. The industry is extending up the escarpment on the shaly, clayey, loam soils of glacial origin.

The most important problem in the growth of grapes in this region is good underdrainage. Next is the maintenance of organic matter. Both are much needed.

Between Cattaraugus creek and Buffalo the production of vegetables and small fruits is the leading business on these soils. The silty, sandy and gravelly soils are used.

Swamp Soils. These are associated with the Lake soils. They represent the areas where swamp conditions prevailed until artificial drainage was introduced. Consequently they are made up of alluvial wash and accumulated organic matter.

Muck Soil. Where the material is mostly organic, it forms peat and muck soils. These are most common in the Dunkirk-Ontario region. They are widely distributed in small and large areas of irregular shape. The Oak Orchard swamp north of Batavia is largest. The South Lima deposit in northeastern Livingston county is perhaps best known for the production of vegetables. Only a small part of these areas are cleared, drained and under cultivation. Drainage is the first requisite. Deposits of a soft lime carbonate known as marl are extensively developed beneath many muck formations and pure deposits are used as a source of agricultural lime.

Vegetables including lettuce, celery, onions and spinach are largely grown. Special fertilizers rich in potash are required.

Clyde Series. The swamp soils of dark color where organic matter does not predominate form the Clyde series. The types range from clay to sandy loam. They are best developed on the Ontario Lake plain west of Rochester, where drained they form very fertile soils for hay, forage and vegetable crops.

Stream Deposits. The deposits formed by the recent overflow of streams constitute the Genesee series. They form wide bottoms along the Genesee river in Livingston county. Nearly all the smaller streams have similar deposits. The loam and silt loam types predominate. Some clay is found in the large bottoms.

The soil is a dark gray color with very little distinction between soil and subsoil. Organic matter is fairly abundant and deeply distributed. This soil is deep and friable, and free from stone. The danger of overflow limits the use of these soils. They are preeminently suited to corn, and canning crops, especially peas, are grown. Hay is extensively produced on these soils. Near Dansville a somewhat higher lying phase of the silt and clay loam is extensively used for the production of nursery stock.

Agricultural Conditions. The farms throughout this region are of medium size and generally range from 50 to 200 acres in area. There are many small farms devoted to the production of fruit and vegetables. Money crops predominate. Where hay and grain are produced, dairying is practiced. Land values range from 60 to 1000 dollars, depending upon location and state of development. The latter figure represents areas set to producing fruits. From 100 to 200 dollars is the more common range in price.

Soil Improvement. With the exception of underdrainage, there are no preeminent lines for soil improvement. The soils require good handling in all ways to which they will respond generously. When well handled, commercial fertilizers do not have a very important place, especially for tree fruits.

Lime has some value in starting acid-sensitive crops. Drainage, good tillage, and the maintenance of organic matter will give very large results.

The area and yields of all the important crops can be much increased by better farming methods. Progress is likely to be in the line of intensity of production and better business organization for all agricultural operations.

THE REDEMPTION OF ORCHARD HILL

E. W. Mitchell, '09

The Experiences of a Cornell Graduate in Building Up a Run-Down Fruit Farm

ORCHARD HILL is a fruit farm of about 150 acres, a flat loamy farm that can only claim the name of "Hill" because the land slopes away sharply on one side to the Kinderhook Creek, which has cut for itself a deep broad bed to carry away the cold air from the trees nearby, as well as the excess water.

When I first saw the place, it did not look prepossessing, in fact, no one in passing gave it more than a pitying glance. The barn had been burned and the two year old ruins had gradually spread over the yard and garden, and for twenty years tenants had let the fences sag and fall and everything run down. The trees looked forlorn. The pears were full of blighted limbs that had been uncut for years and the apple trees were thick with limbs that were dead and dying. The place recalled to mind Goldsmith's description of the "Deserted Village".

To recount how I inventoried and appraised every tree and shed; every acre of ground and improvement; how I figured on the cost of repairing, building up and replanting, and lastly how I labored with unsympathetic people to forward the necessary money to buy the place would take too much space for this article: but finally on Dec. 1, 1909, I owned Orchard Hill with some aged cows, horses and tools and a very little hay and straw.

I could write a book on the little incidents that made each day interesting, the trifles that make farm life what it is; how on Dec. 2nd, Old Stump, the best horse of the four got colic and died—as much, I think from my too generous use of medicine as from colic; how George and I skinned him in the cold and snow, and sold the hide for enough to pay for the days labor. How I tried to sell the cows to a butcher who refused to risk driving them home in their sad condition, so I perforce, had to turn butcher and peddler myself; how "Old Doll" would lie down to sleep in harness and send the cold chills up my spine, and many other things that go to make up the game.

But now for the work: first I cut the suckers around the base of each tree, I dug out the borers, of which there were as many as eight in some trees about 1800 in all, and found hunting borers much better sport than hunting rabbits and far more profitable. Next I cut out all the collar rot, diseased bark on the trunks, trimmed any wounds and painted the bare spots with strong lime sulphur, followed by gas tar. This was a long, back breaking job, but at last it was done, and I knew that the base of every tree was as near right as surgery could make it.

With the foundation laid, we started on the tops. First I cut out all broken, dead or diseased wood and found that there was not much more pruning needed. Where there were water sprouts we thinned them out to be two feet apart, and headed them back to half of the season's growth or more. In five years we have gotten some good new limbs, and good bearing wood from water sprouts pruned and headed back each year in this manner. What little pruning had been done before had consisted mainly of cutting the water sprouts from the main limbs as far as a man could reach. This produced long naked limbs with a tuft of bearing wood at the end. These limbs have a tendancy to split and break more than shorter limbs with bearing wood all along. To correct the "mule tails" as I call the branches mentioned above, we preserve and train the water sprouts and in addition head

back and thin out the bearing wood from the outside to let sunlight into the center and encourage bearing wood inside to grow and make up for wood taken from the outer ends of the branches.

I am not in favor of dehorning a tree, except in rare cases, but prefer to cut and shape a little each year and accomplish the result without a severe shock to the tree or the loss of any crop of fruit. This pruning followed by intensive cultivation naturally produced a heavy growth of water sprouts, and now our pruning consists mainly of cutting out limbs that have broken under heavy crops and thinning and training water sprouts in the way they should go. The pruning of old trees is the best training for pruning young trees; knowing how a tree grows when left to itself, we can prune a young one according to its nature. Going on this principle, I have not followed the plan of the vase shaped tree with a hollow center so much used in the West, but with most varieties trained for a tree with a strong center and lateral branches coming off one above the other in a spiral to avoid crotches. Before pruning young trees I would always advise one to go and study some old trees of the same variety if possible.

In the beginning, I said, this is a flat, loamy farm except for one distant field of clay knolls and hollows, this is a good general description of the soil, but it would not have been accepted five years ago. Generations had taken crops away without giving much in return and the forty-acre lot once famed for its yield of hay, grain and potatoes was abandoned to quack grass and so devoid of humus that sand was a better term to apply than loam. It was dry. The effects of summer drought were to be seen there first and lasted longest. The corn and potatoes I planted there were hardly worth harvesting. I learned my lesson in one year—that is my consolation for the mistake I made of trying to crop the orchards on that starved land. The labor of fitting, planting, care and harvesting has since been given to the trees and the orchards are now plowed shallow, with a three gang plow in one-third the former time and cultivated with a big Forkner L. D. harrow at the rate of 25 acres a day, every week, which produces a fine seed bed for the cover crop which is put in just after a rain

2 1

TWENTY YEAR OLD BALDWIN TREES USED IN AN EXPERIMENT WITH IRON SULPHATE

Tree No. 1—An illustration of "mule-tail" branches, vase-shaped, hollow centre and crotches. Tree No. 2—Central limb and spirally placed lateral branches, no crotches and bearing wood nearer the centre and better distributed.

in July or August, depending on the season and the amount and condition of the fruit on the trees. The cover crop was quite a problem at first; buckwheat and rye seemed to be the only things that would catch, and they did not grow well, but each cover crop plowed under is a prelude to a better one to come after, and now we sow buckwheat, rape, vetch and either rye or oats and it always makes good growth.

It is a satisfaction to compare the soil, dark and rich in humus now with the dry sand of five years ago. To kick up moist soil, where it used to be dry as far as you could go, to see the fruit and foliage keep green and growing and show no effect from the summer drought, where at first the leaves and fruit looked dry and would not put on size.

When you realize how much of our tree and fruit is water, you can see why I want to make the soil as spongy with humus as possible to hold the excess water of the spring for the lean dry spells in summer.

It is quite a problem how much, and where best to spend the time and labor on a farm and it takes experience and lots of figuring to work out the problem. In the older orchards we plowed the tree rows clean and kept them so, which means lots of work with a one horse plow and many unavoidable injuries to the trees. Now we are trying the new plan of leaving five feet on each side of the row in mulch and only cultivating the centers. This is a great saving in labor and tree injury, and I think will bring as good crops as all clean cultivation.

On the young trees the reverse is the case. We keep the tree rows cultivated and seed down the centers to hay or clover crop, concentrating as much labor as is profitable on growing the trees and as little as we can on the secondary crops.

We have been fairly successful in getting a fairly uniform yield from all the trees each year, which I much prefer to a heavy crop every other year. We have had no trouble getting pickers to pick the crop, but our main trouble is packing and marketing. If feel that if I grow and produce the crop. some other man ought to pack and sell it, it is hard for one man to do both and do it well. However, we tackled the proposition and are slowly learning that end of the business. We started as usual the first year by picking a few pears and piling them on the ground; I knew better, but was busy building

THE APPROACH TO ORCHARD HILL

a packing table and so let the pickers get ahead. A shower came up with plenty of wind to blow the dust around and those pears were a muddy mess. Since then everything has gone directly from the tree to the table and then into the barrels and away ; or else in barrels to be stored and sorted later, but never to be sorted from piles on the ground.

Every year we have the same trouble getting the fruit sorted and packed correctly and are still in a state of evolution, but some day we will work it out as we have other things, and hope to have a well balanced, smooth running factory, producing apples and pears and delivering them to consumers with profit and pleasure to both.

WHAT SCIENCE IS DOING FOR THE FRUIT-GROWER

W. H. Chandler

Professor of Pomology, New York State College of Agriculture at Cornell University

WHEN the editor of THE COUNTRYMAN requested an article on what science has done for the fruit-grower, he probably had in mind the results of experiments directly concerned with phases of fruit culture. The number of scientific experiments directly concerned with fruit-growing that have been conducted long enough to gain conclusive results is rather small if we do not include those concerned with combatting insect pests and fungous diseases. However, no discussion on this subject can be adequate that does not recognize the contributions to practical fruit-growing that have been made by men working in pure science, generally with little consideration of immediate practical results that might follow their work. Practically all experiments concerning fruit culture, that have any appreciable value, make use of this fundamental knowledge previously worked out by scientists.

Thus, in the case of spraying, while discoveries of useful methods of applications have been made by both practical men and experiment station workers directly interested in problems of the fruit-grower, the great contributions that have made our spraying system possible came from scientists who have studied fundamentally the organisms against which we spray. In the same way experiments with cultivation and fertilization of orchards can not be usefully interpreted without bringing to bear large numbers of facts concerning plant growth that have been discovered by scientists. Results of experiments with cold storage may appear simple enough when explained by men who have done the investigations, and yet none of the experiments could have been planned to give the useful information that has been secured from them except by making use of a knowledge of the respiration of plant tissue, and other facts concerning plant life that have been made available through the work of fundamental scientists. Thus, all plant science is related, and no results of experiments concerning practical methods of fruit-growing can be usefully interpreted except by making use of very many scientific facts.

Some of the experimental results of immediate application to fruit-growers, so far as they can be discussed within the scope of so brief a paper, follow.

The relation of the different fruit crops to climate is of great importance. Thus, in the case of the peach, reasonably careful observations have shown that we may expect killing of the buds in winter when the temperature goes as low as −10 to −12 F., and in sections where records show that such a temperature may be reached in any large percentage of years, peach growing would not be safe. Results of observations from weather bureaus, etc., show that since the cold air is the heavier and settles we may expect the coldest places to be low places in any given locality, and back of wind breaks, etc. Thus, it is a general

rule on a still, cold night that the warmest places will be on the windward side of a hill. Where the prevailing winds during the cold period are likely to be from the northwest, the most protected position for an orchard, then, would be on the northwest slope of a hill or on the top of a hill. This is, of course, in cases where the location is not complicated by the presence of large bodies of water. These furnish by far the greatest protection from cold.

With regard to planting trees, while still many very exacting precautions are recommended by some authorities, experimental results indicate that the important considerations in planting are very few. It has been definitely determined that by planting young trees in the fall better growth the following season may be expected, this being possibly explained by the fact that root growth seems to continue very late, and that some root growth may be expected when the trees are set in the fall. Of course, this would not apply to sections far enough north that the trees recently transplanted would be injured by low temperature. With regards to methods of planting, the Woburn Experiment Station, at England, has learned that many of the precautions often recommended, such as cutting smooth wounds at the ends of the roots and straightening the roots at planting, etc., are of little importance. The very important considerations in planting are to have the soil around the tree pressed very firmly, and the tree set at approximately the depth it stood in the nursery, never more shallow, since this may result in winter injury at the crown, and never more than two inches deeper.

Of all phases of orchard practice, perhaps pruning has been least adequately studied. Concerning the whole question of shaping the tree, we have practically no experimental knowledge. With reference to the fundamental effect of cutting away large portions of the top of the tree in pruning, the Woburn Experiment Station has shown that this results in a dwarfing effect on the tree. Often trees that had been pruned heavily were found to be smaller after the first few years' growth, and came into bearing later than trees pruned very little at planting or afterward. Summer pruning has a greater dwarfing effect than winter pruning.

With reference to tillage in the orchard, results from the Geneva Experiment Station indicate that under average conditions tillage with a cover crop will give much better results than where the orchard is in sod, though perhaps in a few soils the sod orchards may give as satisfactory results as those having tillage. The Woburn Experiment Station seemed to find that grass in an orchard has an injurious effect that can not be explained, by the reduced moisture supply or reduced fertility. Where the moisture supply and fertility were of the best, still the grass had an injurious effect which may possibly be explained by injurious excretions from the roots of the grass.

This effect may be different in different soils and with different sod or intercrops. So these results seem to indicate the wisdom of extended experimenting to learn the effect of sod on trees with different soil conditions, and the effect on the trees of different crops grown in the orchard.

Concerning fertilizers for the orchard, the results of experiments seem somewhat contradictory. However, results certainly indicate that it requires a poorer soil to need fertilizers for trees than for grain crops in spite of the fact that chemical analyses seem to indicats that larger quantities of fertilizer materials may be taken away from the soil by the fruit crops. At the Geneva Experiment Station, trees in a reasonably fertile soil have shown practically no response to large applications of any form of fertilizer, although the same station seemed to obtain results from the use of nitrogenous fertilizers near Rochester, and the Pennsylvania Experiment Station has secured very marked beneficial results from the use of stable manure and from nitrogenous fertilizers, although results with other elements

seemed to be somewhat uncertain. While these results seem perhaps somewhat contradictory, yet it seems to me that they give a fruit-grower useful suggestions as to the best method of fertilizing his orchards. It seems highly probable that in a medium rich, clay soil, at least every other important phase of good orchard care should be attended to before fertilizers are used, and if the yields are rather large the grower may be reasonably certain that he is safe in omitting the use of fertilizers. While in very poor gravelly or sandy soils, if conditions are otherwise favorable for good yields profitable results may be expected from the use of nitrogenous fertilizers at least. Experiments certainly indicate that potash is of much less importance as a fertilizer material for orchards than it has been considered to be. The range of experimental error with trees is so wide that in all probability it will be a very long time before a grower with a soil that may be but slightly lacking in fertility can know whether or not the use of fertilizers would be profitable, and it seems very doubtful if the grower could determine this for himself unless his need for fertilizers is very evident. If he attempts it he certainly must expect to lay out several plots for each treatment, so that he can, in a measure, overcome the experimental error, and he must keep very careful records.

By far the largest contribution from science to the fruit-grower has been concerning the subject of spraying. In fact, the work of scientists has probably made fruit-growing on a long scale possible by determining methods of combating insects and diseases of the orchard.

With regard to storage of fruit, the experiments conducted by the Bureau of Plant Industry, of the United States Department of Agriculture, have greatly changed the methods of storage and the temperatures at which the fruit is held. At the present time, as a result of their work, the storage men recognize that the best temperatures for most fruits range from 30 to 32°F. Certain experimentors have also shown that in many cases profitable results may be expected from pre-cooling the fruit before it is placed in refrigerator cars. Interesting pre-cooling apparatus has also been worked out by the Department. This should not be considered as approaching an exhaustive survey of the work that has been done by scientific investigations for the fruit-growers. Only some of the more striking contributions have been mentioned.

The contribution of science to the fruit-grower certainly should not be measured by the results of finished experiments. Many scientific discoveries concerning plant life are not directly applicable to fruit-growing, yet they make possible the planning of experiments in a way that useful results may be obtained, and many such experiments are at the present time under way. Since the same practice will give different results on different seasons, experiments concerning practices in fruit-growing necessarily require long periods of time before conclusive results can be reached so perhaps the most valuable results for the fruit-grower will come from experiments not yet finished or from fundamental discoveries that will give more conclusive results by eliminating sources of error that would be overlooked but for such fundamental knowledge.

Then there is a mass of scientific knowledge available that may be applied to solve new problems that the fruit-grower may encounter. Thus, if a new insect pest or fungous disease makes its appearance present knowledge of such organisms could be applied in learning a means of control much more quickly than if such knowledge were not available. Such knowledge is also constantly being applied to prevent the introduction of such pests.

Scientific knowledge then is not only being constantly applied toward the solution of present difficulties, but it also serves as a sort of insurance against serious loss from new difficulties that may appear in the future.

HOW TYPES OF FARMING IN NEW YORK ARE DETERMINED

K. C. Livermore

Professor of Farm Management, New York State College of Agriculture at Cornell University

NOTE—This is the fifth of a series of articles dealing with the Agriculture of New York State. The series will be continued in the March issue.

NEW YORK has soils as poor in fertility as any in the world and soils as rich as any in the world. Its soils vary in texture from the lightest sands to the heaviest clays. Between these extremes of fertility and texture are all gradations. Sections of New York have a growing season of less than 100 days—shorter than parts of Alaska; other sections have a growing season of 200 days. Small areas of the State receive so little rainfall that they are almost semi-arid. The annual rainfall in different sections varies from less than 25 inches to over 50; the rainfall for the 5 months, April to August inclusive, varies from less than 14 inches to twice that amount. Topographically the State includes both extremes, the rugged mountains of the Adirondack and Catskill groups and the gently rolling stretches, the beginning of the praires, in the northern half of Western New York and all the intermediate phases. Some New York farms are located 15 to 20 miles from a flag station and 30 or more miles to a town with more than one barber shop, while 85 farms were reported by the last census in New York County, the center of the most densely populated section of the western hemisphere. To meet profitably these widely different conditions many types of farming have been evolved.

The early settlers brought with them their seeds and their stock, their few crude implements and the methods and practices which had succeeded in their former homes. Immediately there was begun an experiment of greater proportion and complexity than any yet conducted by an experiment station. Each new settler took an active part, for the results were vital to him personally. It was an experiment to determine what crops and what varieties of each crop paid best on every farm that was cleared; to determine what methods of tillage and seeding were best; to determine what kinds and breeds of stock were most profitable under those particular conditions; and then to determine what combinations of crops and stock paid the farmer and his family best for their year's work. The settlers came from many different places and each one had different notions to try. Practically everything known at the time was tried and the things that succeeded endured—the others were discarded.

As population increased and markets developed, readjustment became necessary. Extensive building of railroads intensified the competition between different parts of the State and with other states. The invention of the mowing machine, the reaper and the selfbinder necessitated changes in types of farming probably as extensive as would be caused by a 50 day lengthening of the growing season. Shifts in the relative prices of products, of land and of labor and various economic changes are continually requiring gradual readjustment of types of farming.

So the great experiment is continued and every farmer in the State consciously or unconsciously is helping to conduct it. Thousands of different ideas are tested every year. Any one proving profitable soon becomes common practice where it applies. Consequently the types of farming and the practices that are common in various sections of the State represent the accumulated experiences of several generations of farmers. The present generation is inclined to overlook the fact that these types of farming and practices are the result of accumulated experiences. It does not appreciate the years of labor spent in getting these

results; nor the great degree of accuracy that has come from the careful checking of results by hundreds of farmers year after year; nor the most important facts of all, that the results apply strictly to the local soil, the local climate, the local marketing facilities and all the other local conditions, and that they have been worked out strictly on the basis of *real* profit. The type or types of farming, then, that are generally followed under any given set of conditions in this State or any of the older states may be considered the best, everything considered, for those particular conditions.

As students, however, we are not content to know that this type here and that type there are correct for their conditions. We want to know why they are correct—why each type has survived the test of time. Too often the presence of a certain type is attributed to "custom" or "habit" which explains nothing, except that the speaker does not know and that it is not always easy to explain. Many factors are concerned but the most important probably are climate, soil, topography, marketing costs and relative profits of competing enterprises. The best way, perhaps, to see how these factors determine types of farming is to study separately some of the different products. It will be desirable to refer frequently to some of the charts published in the preceding articles of this series, particularly to the charts showing the average length of the growing season, figure 4 on page 103; the chart showing the New York rainfall for April to August inclusive on page 105; the chart showing the soil series of the State, page 22; and the chart showing the underlying rock types on page 19.

A NEGLECTED ORCHARD USUALLY MEANS THAT THE GROWING SEASON IS TOO SHORT FOR PROFITABLE RESULTS OR THAT OTHER CROPS, OFTEN POTATOES, FARE BETTER

Apples. Practically every farm in the State has some apple trees and it is safe to say that all the leading varieties have been tried under every condition of climate and on every type of soil in the State. But as most every one knows, the apple industry has developed extensively only in certain sections.

Table 1 shows where most of the New York apples were produced in 1909 and which counties had the highest average yields. In parallel columns is given the average length of growing season for each county or that part where most of the fruit was grown.[1] A glance at the chart giving

[1]Comparison of 1909 yields with average climatic data for a series of years as in Table 1 and following tables is not good statistical practice. But average yields by counties are not available and the climatic data for 1909 alone would not be as valuable as the normal for the purposes of this article. Important variations from the normal are noted, however, and the writer believes that due allowances for such have been made in all statements.

TABLE I. APPLE PRODUCTION IN NEW YORK AND LENGTH OF GROWING SEASON.

Counties with most apple trees, 1909	Number of trees in nearest thousand	Average length of growing season where grown, in days
Wayne	812	165–175
Niagara	804	160–170
Monroe	703	160–175
Orleans	550	160–165
Erie	473	150–170
Ontario	369	160–170
Dutchess	303	160 170
Genesee	301	145–155
Columbia	298	160–170

Counties with highest yields per tree, 1909	Average yield per tree in bushels, 1909	Average length of growing season where grown, in days
Wayne	4.1	165–175
Orleans	4.1	160–165
Monroe	3.7	160–175
Columbia	3.0	160–170
Niagara	2.9	160–170
Ulster	2.8	170–180
Dutchess	2.6	160–170
Ontario	2.5	160–170
Putnam	2.5	160–170

length of growing season, shows that all these counties, excepting Genesee, are adjacent to large bodies of water and that all have growing seasons ranging from 160 to 180 days, excepting Erie and Genesee. These two counties had somewhat shorter seasons, 150 to 170 and 145 to 155 days respectively. They were among the counties with the most trees, but were not among the counties with highest yields. The average yield of Genesee County was 1.9 bushels per tree and of Erie 1.3. Evidently the length of the growing season is a very important factor in apple production. No county with a season much shorter than 160 days had a high average yield or many trees.

The chart of April to August rainfall shows that these counties included those of lightest as well as heaviest rainfall. But the best yields were secured with not over 18 inches of rain in the growing season, in Wayne, Orleans and Monroe counties. They were approximately 40 per cent better than the yields in the Hudson Valley counties with 18 to over 20 inches of rain. Too much rain may interfere with pollination and encourage disease pests.

An interesting fact is the marked effect of rainfall on orchard tillage practices. In Western New York with comparatively low rainfall clean cultivation is practiced quite generally and experiments as well as experience have proved that it pays. But in the lower Hudson Valley orchard districts where the rainfall for the growing season averages from 18 to over 20 inches a much larger proportion of the orchards are in sod. Higher priced hay is partly accountable for this but the principal reason

ORCHARD TILLAGE IS IMPORTANT WHERE RAINFALL DURING THE GROWING SEASON IS NORMALLY 16 INCHES OR LESS

is that, usually there is sufficient moisture to make conservation by tillage less necessary. Geneva, New York, Bul. 375 describes a comparative test of clean tillage and the sod mulch system of Mr. Grant Hitchings conducted on Mr. Hitchings' farm in south central Onondaga County. After thorough trial, the results were a slight difference in yield and considerable difference in cost, both in favor of the sod mulch system—a striking contrast to the usual results in Western New York. But Mr. Hitchings' orchards receive from 20 to 30 and sometimes 50 per cent more rain than those in Western New York.

The best apple yields came from the best soils of the State, the Ontario and Dunkirk series in the lake counties, but the high yields were probably due as much to the very favorable climate as to the soil. The lower yields in the Hudson Valley counties were due partly to poorer soils.

The present day yields and the accumulated experiences of our forefathers as evidenced by present location of our apple industry indicate very clearly that the best locations in this State for apple production are where the growing season is at least 160 days long, where the rainfall is from 14 to 18 inches during the growing season and where the soil is deep and fairly strong. The extensive planting of orchards in such locations is also evidence that apples have paid better there than other crops which compete with them for labor and land. The marketing costs from New York apple sections are probably as low as, or lower than from any other important apple section of the United States. All these facts explain why apples occupy a prominent place in the types of farming of these regions.

But in other sections of the state where the climate is different apples are less important and must be so because of lower yields, higher costs of production and competition with other crops better suited to the climate. To try to stimulate apple production in sections not climatically adapted to the crop is a serious mistake. Cortland County, for instance, with a growing season of only 130 to 140 days and heavy rainfall can never hope to make as much money from apples as Orleans County, or even as much from apples as from potatoes and cabbage to which its climate is well adapted. These remarks apply to whole communities. It is recognized, of course, that certain farms here and there, by some twist of natural forces (or the imagination) will be blessed with an apple climate. But too often, out-of-type farms, like apple farms out of the apple regions, are pointed out as examples of what the community should take up. In most cases those same farms would make more money if devoted to crops better suited to the local conditions and handled with the same intelligence and interest.

Potatoes are grown all over the State but the yields per acre vary widely, the highest county average for 1909 being almost three times greater than the lowest. Table 2 shows the counties with highest average yield in 1909 and the climate of each.

TABLE 2. YIELD OF POTATOES AND CLIMATE IN NEW YORK.

Counties with highest average yield in 1909.	Yield per acre, 1909, in bushels.
Franklin	197
St. Lawrence	162
Clinton	153
Lewis	153
Queens	152
Cortland	151
Wyoming	151
Jefferson	148
Suffolk	143

	Average length of growing season where potatoes are grown.	Rainfall April to Aug. inclusive, in inches. Normal	1909
Franklin	130–150	17	16
St. Lawrence	130–150	15	16
Clinton	130–150	14	14
Lewis	120–140	16	15
Queens	170–190	19	20
Cortland	130–140	20	15
Wyoming	130–140	16	15
Jefferson	130–150	16	16
Suffolk	170–200	18	18

[1] New York County omitted because of very small acreage.

The highest average yield, Franklin County, was produced mainly in a sec-

tion that has a cool growing season, normally 130 to 150 days in length and an average rainfall of about 17 inches (16 inches in 1909) in the season. Evidently such climate is best for potatoes in this State because shorter or longer seasons or less rain resulted in lower yields. Lewis, Cortland and Wyoming counties, for example, had about as much rain as Franklin but because of a shorter season had considerably lower average yields. The potato districts of Franklin, St. Lawrence and Clinton counties have about the same soil and growing season, but the rainfall is different. Clinton County usually has 2 to 3 inches less rain than the others and usually has a lower yield, as in 1909.

POTATOES ON LONG ISLAND

Proximity to markets makes potatoes important there altho the climate is not the most favorable. High prices and plenty of rain make heavy fertilizing profitable. Bordeaux spraying is more important there than in cooler climates.

Queens and Suffolk are the only counties with a growing season over 150 days that had high yields. A long season in this State means a hot summer which is unfavorable for potatoes. The too long season was compensated in each case by good rainfall, 20 and 18 inches in 1909, and by heavy applications of fertilizer. These two counties are located right at the New York markets and consequently receive better prices than the upstate counties. Higher prices and good rainfall justify the heavy fertilizing which resulted in high yields in spite of a season too hot for best results.

Potatoes are much more sensitive to climate than to soils. The heaviest soils are not favorable but otherwise texture and chemical analysis seem to make little difference in the yield. The sections in this State that offer the most favorable climate and have very good yields, in many cases have soils of very low fertility.

Potato spraying and fertilizing practices show very close relationship to climate and prices, in fact closer than do the usual recommendations. The usual application of fertilizer to potatoes on Long Island is 1000 to 2000 pounds per acre; in Franklin County 300 to 600 pounds; in Monroe County 200 to 300 pounds. What are the reasons for the differences? Is it just "habit"? Are the farmers wrong in two of these sections? Or do the following facts explain the enigma? Long Island has heavy rainfall, highest prices for potatoes and soil poorest in plant foods but nearly ideal in texture for this crop. Franklin County has medium rainfall, much lower prices for potatoes and soils of medium fertility. Monroe County has light rainfall, prices of potatoes about the same as Franklin and most fertile soils. Apparently these facts do explain. On Long Island fertility is the limiting factor. There is enough rain to make available the heavy applications of fertilizer and potato prices are high enough to pay for them. Monroe County and the counties west lack rain for best potato yields and fertilizers can not help much. Franklin County can use more fertilizers than

Monroe to advantage because of a better climate but the price of potatoes is not high enough there to justify as heavy applications as made on Long Island.

Spraying potatoes with bordeaux mixture is a very common practice in Long Island potato sections. A comparatively hot season with plenty of rain favors blight. And after putting on that 1000 to 2000 pounds of high grade fertilizer Mr. Grower is likely to do all he can to get his money back, so he sprays. In the potato districts of Franklin and adjaccent counties very little bordeaux mixture is used. Where the vines are so green and vigorous at digging time that it is impracticable to use a machine, there is certain to be not much loss from blight. This is usually the condition in the best of those potato sections. Cool seasons and excellent air drainage on the St. Lawrence and Champlain slopes afford protection. In the western part of the State some spray and others do not, depending on how important the crop is to them —how much money and labor have been invested. Spraying with bordeaux there is like insurance—a good thing when there is a possibility of losing quite a little.

Level and hill culture of potatoes, and varieties will show equally close relationship to soil and climatic conditions to those who are observing.

But these counties with the most favorable potato climate and high yields do not grow the bulk of the New York crop. Other factors besides climate are concerned. It happens that a good potato climate is also a good hay climate, and hay is probably the most profitable New York crop for the labor concerned when grown on the moderate priced land in the upstate counties. On the higher priced Long Island land, potatoes have to compete with all kinds of truck crops. Consequently potatoes do not have a monopoly of the land or the labor in these sections and even if they did, the area would not be sufficient to supply the demand.

Table 3 lists the counties that had the largest acreage of potatoes in 1909. Size of county, of course, influences this selection to a certain extent but not enough to mislead us in seeking the real explanations. The first clue

TABLE 3. NEW YORK COUNTIES WITH THE LARGEST ACREAGE OF POTATOES IN 1909

County	Acres of potatoes in nearest thousand	Yield per acre, 1909, in bushels	Average length of growing season	Rainfall Apr. to Aug, incl in inches 1909	Normal	Large cities in or nearby the county
Steuben	31	107	130–160	17	14	
Erie	24	128	130–170	16	16	Buffalo
Monroe	20	138	160–175	15	15	Rochester
Suffolk	15	143	170–200	18	18	New York, etc.
Ontario	15	111	160–170	16	13	
Onondaga	14	121	140–165	18	14	Syracuse
Allegany	13	122	120–140	20	15	
Livingston	11	129	140–160	16	13	
Washington	10	132	140–150	17	15	Troy, Albany
Rensselaer	10	114	140–150	17	15	

is the fact that all the big cities of the State are in or near certain of the counties listed. It looks as if proximity to the cities were a strong inducement and it undoubtedly is. The weight, and hence the cost of transporting potatoes is higher in proportion to their value, than that of most farm products. The saving of this cost is often enough to warrant growing potatoes near market in competition with better producing sections farther away. And so it is that Suffolk and Monroe counties, influenced by the New York and Rochester markets, are important potato producers although not favored climatically. Erie, Onondaga and Rensselaer counties influenced by the Buffalo, Syracuse and Albany and Troy markets respectively, and with climates not entirely unfavorable to the crop, are likewise important.

All the other counties in Table 3 have fairly good climates for potatoes. Steuben might have been in the high yield class in 1909 if the rainfall had been normal.

In Steuben, Allegany, and Washington counties another factor supplements the climate. It is lack of competition. The seasons are too short for apples, beans and corn; the seasons are too short and the soil not right for hops; it is the same with tobacco except for small areas in Steuben; and markets for truck crops are lacking. These crops are the chief competitors of potatoes.

In Ontario and Livingston counties potatoes have to compete with corn and beans and with apples to a certain extent. Parts of these counties have especially good potato soils—the lighter types of the Dunkirk and Ontario series. On these, potatoes have an advantage over their competitors. In both counties, however, the crop is less important than one of its competitors, corn in Ontario and beans in Livingston.

Competition between potatoes and apples for labor at harvesting time is very keen. The heaviest part of the work on both crops comes at harvest; and in New York both are harvested about the same time. Different climatic requirements keep the two crops well apart but when other factors bring them together as in Monroe County, the general practice is to grow potatoes on one farm and apples on another. Large areas of both crops are seldom found on the same farms. The labor congestion is likely to result in excessive labor costs or loss of part of the crop.

The combined effect of all the factors has been to make the potato crop an important feature of the types of farming, first, in sections where the climate is favorable; and second, in sections with less favorable climates where either nearness to market is an inducement or lack of competing crops gives potatoes first place in its class. To a limited extent potatoes are conspicuous also on especially good potato soil even though climate is not the best and competition is keen with crops better suited to the climate.

To be continued.

SOME FACTORS IN THE PROPAGATION OF NURSERY STOCK

Samuel Fraser

WE have been propagating nursery stock in a commercial way for some years and have attempted in a small way to try to find out some of the causes of variation. Much has been said at various times as to the value of propagating from trees of good performance. On the face of it, it looks a plausible theory. We have horses, cattle, and sugar beets propagated on performance records and even timothy at the present time. Why not fruit trees? Why not take our buds for the propagation of our nursery stock from a strong, healthy, vigorous, productive tree, rather than from some unknown source in the nursery row or from some other place. To the average mortal it seems as though it would be better to bud from a tree which is vigorous, healthy, and long lived rather than from a poor specimen, and as a rule the nurseryman has always been trying to propagate from the strong-growing, vigorous individual because he could usually cut a much stronger bud. There is no one who recognizes the importance of a strong bud more than the man who is budding, and a careful budder of nursery stock will sometimes throw away 50 per cent of buds on his bud stick because they do not appeal to him as desirable. How much of this is founded on truth and how much notion I am not prepared to say. Some men seem to be much more impressed with the character and size of the bud than others, and some nurserymen contend that the difference between a good stand and a poor stand depends upon the number of

buds which the budder rejected and how he handled those he cut. Whether the details embraced in budding influence only the stand and the growth made in the nursery or whether its influence is transmitted through life is not known. Whether a bud taken from part of the stick makes a big tree or whether a bud taken from another end of the stick makes a small tree is unrecorded, some believe it does, but there is one interesting fact which must be remembered and that is we may propagate a Baldwin or a McIntosh on three different types of stock, say the Paradise, Doucin and the French Crab. The one is a small dwarf tree, the other one is medium size and the other will develop into quite a large sized tree. There is a wonderful difference in the size which these three individual trees may attain, but there does not seem to be any marked difference, we may say none at all in the fruit borne by them. A few have contended that the dwarf trees would come into bearing somewhat earlier. This might be granted and it may be so for in some cases they do, but there is no marked difference in the fruit itself. We have no variation occurring to a marked degree. Neither have we in cherries any difference in the fruit of a variety when grown on Mahaleb and Mazzard roots or even in pears on pear and quince roots, at least I do not know of any.

Probably all are familiar with the work of Dr. Shamel in California where he found that among lemons, oranges and grape fruit, especially in the Navel Orange which is a relatively recent introduction in California, there are at least seven variant types. These types represent all shades of profitableness to the orchardist. One type is practically worthless, another type is extremely valuable and there are trees of different degrees of value between; also it is his idea that individual differences of the fruit are perpetuated, and that buds taken from the unproductive tree will reproduce unproductive, strong-growing, but worthless trees far as profit is concerned. Also when these unprofitable trees are cut back and the branches are top worked to the profitable tree, the story is entirely different, the tree becomes profitable. This adds a certain amount of zest to our investigation as to whether this is true of oranges, lemons and grape fruit only. Dr. Shamel believes that he has isolated three or four distinct variable types in Elberta peach while working on this problem in New England and that these different peaches could be reproduced in exactly the same way the oranges are being reproduced in California. If it is true of oranges and other things why is it not true of apples, pears, peaches, in fact, all our fruits? We have currant bushes which have borne 20 and 21 pounds of fruit in a year at five years of age. Would these be more desirable to propagate from than a currant bush which bore 8 pounds or 10 pounds? In other words, would you rather have bushes propagated from bushes which are heavy producers or from poor producers, knowing that the ability to reproduce may have been due in part to the relative positions of the plants? But when we come to bushes and plants in which the relative positions do not seem to be the controlling factor it then becomes the part of research to see whether these individuals will perpetuate themselves and this is the most important part of the work. The difficulty surrounding it is that it is a very slow proposition. There is nothing to be secured under twenty years, especially in the case of apples. It will take a term of years after the trees come into bearing to determine whether they are going to reproduce their parent. It will also take a term of years to show what the parent is capable of doing. Realizing that no harm would be done by working from individual trees and that the purchasers of the trees would suffer no loss by having individuals propagated from individuals of merit, so far as they appear, we have felt it might be worth while to undertake to find out something about the problem. The

work has been of interest and the results suggestive, although we have not yet secured enough evidence in regard to the ability to transmit productive power to draw deductions. We have found that certain trees would not reproduce a sufficient quantity of first class individuals to warrant their being continued in the nursery. In other words, some trees do not seem to be able to produce as strong growers as others. It may be all the difference between 20 and 40 per cent of trees 4 feet and upward in height in the first year, or 100% variation. This continued is a very important item to us because at the present time the purchaser of trees wants wood and if we can give him six feet of wood in a one year old, he would much rather have the tree six feet tall than one which was three. In the same way the purchaser would much rather have a tree three-quarters inch thick when two years old than one five-eights inch, and if we find individuals which will grow 40 per cent in the block three-quarters inch while another tree can produce only 20 per cent of three-quarters inch we are forced to grow the one which will give us the larger proportion. This difference seems to be transmitted through three successive generations even when reproduced through nursery stock; that is, in order to see whether it would be maintained for three successive generations, we have taken our buds from the strongest individuals in the nursery row. For instance, we find that 3.21 which is the number of a Spy tree in one particular orchard, even when reproduced through the nursery stock three times is giving a larger number of number one trees in 1914 than any other and holds the same position in regard to two other trees that it did in 1910. The same way, our best growing McIntosh in 1910 is still our leader in 1914; it will reproduce more strong-growing trees than any other tree number. One Bosc tree of which

ONE OF OUR HEAVY PRODUCING R. I. GREENING TREES WHICH PRODUCED 14 BARRELS AND BORE FOR SEVEN CONSECUTIVE YEARS VARYING FROM 4 TO 14 BARRELS PER YEAR

we secured a limited number of buds has proven to be a much stronger grower than two other Bosc trees. All three of these trees which constitute our foundation stock produce high quality fruit and it was of interest to us to determine which of these would give us the finest and strongest trees, since both individuals seemed alike in regard to the fruit itself. One of them is so much stronger grower than the other that for commercial purposes it is the only one to grow. For instance, out of one row of 500 trees, 80 were eleven-sixteenths inch in the one case, whereas out of 1500 trees from the other source we could find but fifteen of this grade, and this variation in strength of growth is maintained in the second size, namely the five-eights inch; these being the grades which we make. In Rhode Island Greening we are propagating from ten individuals, in Baldwin, 14; in McIntosh, 5 and so on. In Oldenburg we found that three trees which are in the orchard of Collamer Bros. at Hilton, which were top-worked by their father, gave us stronger growing individuals in the nursery than the buds secured from two other sources, and they were so much stronger that we have practically no others at the present time.

In propagating Bartlett Pear our main effort has been to secure the buds from strong-growing individuals which have no appearance of red wood. Red wood is one of the serious factors and we are not sure as yet whether the propagation from individuals which appear to be free from it will be the controlling factor or not.

Of course, in our work we are budding seedlings, which in themselves are probably representative of all shades of difference so far as growth is concerned. Among apples and pears some are spiny and some are smooth; some have large root systems and some have small, but we grade all of the strong-growing seedlings together and plant them out. Some may make a good union with the variety and others may make a weak union, and it might be that the weaker union produced the weaker-growing tree, whereas the relative merits of the buds put on the stock were the same. The more we look into the question the more complicated it becomes, and at the present time to state that any given factor is the cause of differences would be, practically speaking, preposterous. But in the nursery where we work with thousands of trees there is a strong

A

A WELL CARED-FOR NURSERY

Row —**A**—A very uniform row of Wealthy, shown as whips. The following year nearly every tree was $\frac{11}{16}$ and No. 1.

possibility that the different variants are distributed somewhat uniformly, and that, if sufficient numbers be used, these differences in the roots may be overcome so that the results may be comparable.

At present our aim is to see if we can get rid of the differences in vigor by propagating from the strongest growers in the row. In other words, in the Bosc trees we have cut buds from the strongest trees in the nursery row for three generations and this year have budded 6000 trees from each source and in addition have injected a new supply from some strong growing bearing trees as checks. The plants are three rows wide and comparable. If we can repeat the performance under these conditions we shall feel that there is something in it. We are reproducing our apples in the same way. For business it does not pay to propagate from heavily bearing trees because we cannot make as large growing trees in the nursery from such buds as one can secure by working from nursery stock. For instance, a man would go into bankruptcy at the present time if he should undertake to propagate peaches and apples entirely from bearing stock unless young strong growing bearing trees not heavily laden be available. If one uses buds from mature bearing trees the results will likely be 30 per cent off in size and this is sufficient to handicap the business seriously. The only thing to do is to grow a block which we can save for propagating purposes and then from time to time go back to the fountain head. If these are young, that is, anything up to ten or fifteen years old in apples it is probably just as good to take wood from such as from nursery stock, but this is not true of peaches. In peaches, a bearing tree of five will not give one nearly the wood or the vigorous growth that could be secured from a young tree in the nursery row. At the present time all our nursery stock is on the wood basis, whether the trees are propagated from bearing trees or not is not a factor. The size of tree sold is the important consideration to the orchardist buying nursery stock and in this respect the nurseryman tries to do his part and give us as much wood as possible for the money. We aim to propagate from vigorous bearing profitable trees in the orchard which will give us a large percentage of No. 1 trees in the nursery row.

SUGGESTIONS TO TEACHERS OF FRUIT-GROWING IN THE HIGH SCHOOLS

C. S. Wilson, '04

Professor of Pomology, New York State College of Agriculture at Cornell University

THE work in fruit-growing that is presented in the high schools of New York State is a subject that is just receiving careful consideration. This work will develop rapidly in the future, and it is important that the teachers understand more clearly what topics should be presented and what points under each topic should be emphasized.

A careful study of many high school courses in fruit-growing in different states impresses one with the fact that the work is too broad and comprehensive to be thorough. Generally the topics outlined cover the entire field of fruit-growing, and often it is recommended that the work be given in one term. These same topics given in the outlines require two years' work in college. Naturally, the results are unsatisfactory. Instead of fixing a few facts clearly and lastingly on the mind of the student, a dim impression of many facts, generally much confused, is the result. The teacher has failed not only to convey accurate information, but also to train the student's mind.

It is not surprising that these con-

ditions exist. Many of the educators who prepare these outlines, and many of the teachers who do the instructing, are graduates of agricultural colleges. Their training in fruit-growing is based on college courses, and it is natural, therefore, that they should copy somewhat from these courses. Such imitation is all right, provided the subject matter is reorganized to meet the needs of the high school student. Generally, however, too little attention is given to careful reorganization and adaptation. A few points are emphasized here in this connection.

1. The high school work should confine itself to verified facts that are beyond all doubt, or to accepted practices, in cases where insufficient experimental data have accumulated to establish facts. In such cases, discussion of the theory underlying these topics may lead to several different conclusions. Such discussion is a part of college training, but it should generally be omitted in high school work. A good illustration of this point is found in the question of fertilizers for fruits. Considerable experimental work has been done, but results do not seem to coincide, and in some cases appear to contradict. The high school work in fertilizers, therefore, should be a statement of the practices accepted by the progressive growers and should go no further.

2. Topics selected for study in high school should direct the attention and interest of the student to things that are, and can be, done on the farm, that is, they should relate the student to farm life. The work should be planned so that the topics may be taken up in season as much as possible. Outdoor studies should be made in connection with the classroom exercises. To illustrate, the study of fruit buds should be planned for the spring so that the students, after receiving their preliminary instruction, may be taken out to the orchard and shown fruits in blossom. Attention should be called to the fact that the fruit bud of the peach produces a blossom only, and that this bud always appears on wood of the previous season's growth. Similarly, attention should be called to the fruit bud of the apple, which produces not only several flowers but also leaves and is located on lateral fruit spurs. An examination of the topics given under the main head pruning, as outlined below, shows that the topics recommended for use in the high schools are related directly to the work on the farm. Of course this direct relation is not always possible, but it should be emphasized more often than it is.

3. Strictly college work should be omitted in high school courses. It is true that no definite line can be drawn separating high school and college work, but a much more definite distinction can be made than is made at present. To illustrate this point as well as the two points mentioned above, an outline of one of the subjects dealt with in fruit-growing is submitted herewith. This subject is considered as a whole, and is divided into the different topics that would be presented in college. The topics that are suitable for use in high school are italicized.

PRUNING

Definition
Statement of purpose
Preliminary studies

1. Buds
   (a) *Kinds*
   (b) Morphology of
   (c) Factors influencing formation, differentation, and development
   (d) *Distribution of fruit and leaf buds on wood of different ages (all fruits)*
   (e) *Markings (spur and branch)*
   (f) *Fruit spurs*

Physiological principles fundamental to pruning

Experimental work and consideration of results

Root pruning

Experimental work and *statement of practices*

Time to prune

1. *Summer:* Effects
2. *Winter:*

Head formation
1. *Height of head*
2. *Open or closed center*
3. *Pruning of fillers*

Cuts
1. *Small branches*
2. *Large branches*
3. *Dressings*
4. *Healing*

Statements of practices :
1. Apple
   (a) *Young tree* (b) *Mature tree*
2. Pear, quince, peach, cherry, plum, apricot (same as for apple)
3. Grape
   (a) *Methods*
   (b) *Young vine*
   (c) *Mature vine*
4. Raspberries
   (a) *Life cycle of canes*
   (b) *Statements of practices*
5. Blackberry, current, gooseberry (same as for raspberries.)

ADVERTISING THE APPLE

By D. S. Hatch, '15

EDITOR'S NOTE—This speech was awarded first prize at the annual speaking contest of the New York State Fruit Growers' Association.

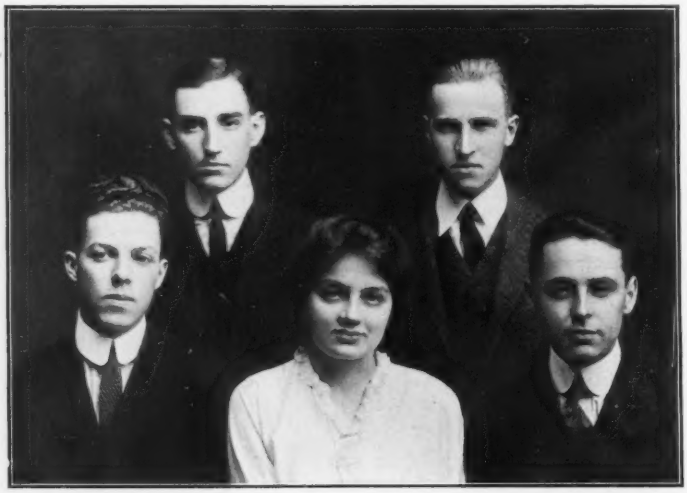
AS just a boy back there in the Upper Hudson Valley, at the time when I first began to take a business-like interest in the home farm, I remember, as one of the very few things that worried me then, this—that sometimes in the fall, when the trees in the orchards hung full of beautiful, ripe, red and yellow apples, my father would say, "The prices are so low this year, those apples are not worth picking." I have just been home for a vacation. The bins and barrels in that same old cellar are full of large first class apples ; and if sold at all they must go at the ridiculous price of about sixteen cents a bushel.

According to the definition of our leading economists whenever the demand for a commodity is not great enough to sell it above cost there is over-production. The two reasons for this condition in the apple world are, first, the enormous acreage of young trees coming into bearing, and second, the fact that the people are not eating apples as they formerly did ; while at the same time oranges, bananas and grapefruit have, through the aggressive, organized advertising methods of their producers, have by leaps and bounds, captured the appetite of the consumer. Many of you remember when oranges were given as Christmas presents, so rare were they. Over one hundred thousand more carloads of oranges were used in this country last year than twenty years ago. Bananas and grapefruit have made like gains at the expense of the apple. I have no desire to exaggerate the dangers of over-production, there is no need for it. Even the more optimistic of you apple men who believe there will always be sale for all the apples, even you, agree that in years of a big crop the prices are likely to be discouragingly low ; agree that there will be, in that sense, over-production.

All men agree likewise to my second point—that the remedy for these conditions lies in increased consumption. And the hopeful thing about it is, consumption can be increased—increased, just as the consumption of oranges, bananas and grapefruit has been increased, through organized publicity methods, just as the use of any other commodity is increased through advertising. If advertising makes thousands of people dope themselves with patent medicines, will it not encourage them to eat more apples? If advertising sells chewing gum by the large box, and sets people's jaws wagging all over the world, will it not sell apples? If advertising has *made* enormous mail-order firms, will it not remake apple supremacy? We are going to advertise the apple in the

daily and weekly press of the country just as grape juice and breakfast foods are advertised. At least ten persons drink grape juice to-day where one did before it was advertised. Where would breakfast foods be if they were not advertised? We are all familiar with the negro in his white cap, as he serves breakfast food. Shredded wheat is known from its advertisement and used in enormous quantities. Over in the countries of Europe, breakfast foods are as yet little advertised, and practically unknown in use. But over there we see American brands of pickles advertised in the cars and public places, and the whole "57 varieties" are used in large quantities. Back in Ithaca, my last Saturday night there, riding up the Hill toward the University, in the street car I read an illustrated sign something like this: "At the close of a day's work, a glass of refreshing beer," and I thought how I would like to change that sign to read, "At the close of a day's work, a Tompkins County King."

That sign paid or it would not remain there. Likewise are paying the beautifully illustrated car signs, which the Northwestern Fruit Exchange and other concerns are using to advertise their apples. The cars of the subways and elevated lines in New York City, displaying these signs, carry over two and one-half million people a day, a good sized audience! Likewise will pay all the other features of the nation-wide advertising campaign which our national apple advertising committee is pushing national Apple



THE ROCHESTER STAGE

N. C. Rogers (Second) E. D. Rogers
R. P. Sanford Miss H. L. Clark D. S. Hatch (Winner)

These five students competed at the annual meeting of the New York State Fruit Growers' Association for the fifty dollar prize which is offered by this association. All the speakers are now taking work in pomology, or have taken courses in the department. This is the fourth competition of this kind that has been held.

The speeches, all of which pertained to fruit growing, were entirely original. The work of these students exemplifies the nature of the work carried on at the College, the idea being not only to impart information to students but also to enable them to present such information in an effective manner. The prize of fifty dollars was divided as follows: First, $35; second, $15. D. S. Hatch won first place with N. C. Rogers second.

Day; the printing and distributing of hundreds of thousands of those attractive little apple receipt booklets "197 Ways to Cook the Apple," and the encouraging of every day use of the apple through attractive articles in the leading periodicals setting forth its value as a food. Back at Cornell, the women in the graduate school of the Home Economics Department are making a series of experiments in cooking the apple, with the hope of producing dishes so tempting to the eater, that it will be possible to persuade the hotels of the country to give the apple a prominent and regular place on their menus. Our advertising committee has enlisted twenty-two thousand dealers in the large centers to work for a smaller profit on each box and barrel of apples sold and a consequent greater number of sales.

Have you seen that effective picture in two parts—on the one side an orchard with the ground under the trees covered with apples going to waste, and on the other side a row of city children, their noses pressed against the glass of a store window, looking longingly at baskets of apples marked with high prices within. Ladies and gentlemen, the children of this land would almost eat its apples if given a chance. Five times as many apples were sold in Chicago during the weeks of advertising and price cutting as any other week—even greater results here in Rochester. What has been accomplished in these cities can be accomplished in any city—in all cities. You see the possibility of increasing the consumption of apples.

Shall it be done? The answer to that question hinges largely upon this second one: will the apple men, united, provide a fund to make it possible to continue this advertising propaganda? Many of you remember, how in January, 1913, Mr. U. Grant Border, Secretary of the Apple Advertisers of America, at a meeting like this, here in Rochester, addressed this Association, and as a means of providing an advertising fund, presented the Stamp Plan. You remember how, at the close of his address Mr. Clark Allis, then President of this Association, warmly endorsed the Stamp Plan, saying he would be one of the first to place a stamp an every barrel and box of apples he shipped. The Stamp Plan was likewise endorsed by leading apple men in all parts of the country. Then, it is discouraging that Mr. Border has to write as he has just now to me, "We were unsuccessful in launching the Stamp Plan for raising funds, the principal reason being that without sufficient men and money to organize the whole country we could not accomplish this big work." Then he gives just one ray of hope in these words: "This, however, may come next year." And right here is my big job this afternoon, our big job, an attempt to make this ray of hope become a glowing reality.

You men of initiative, will you not get in touch with Secretary Border at once; will you not organize each one of you in your section a local committee, which shall cooperate with the national committee in putting apple revenue stamps on sale at your local banks, and aid in encouraging every shipper to voluntarily place a stamp on every barrel and box sold? Every man, thus, will support advertising in proportion to the amount of fruit he sells. This is the exact principle of the method which has enabled citrus fruits to put the apple in the shade. Listen to President Powell, of the California Citrus Fruit Exchange, as he says: "Each member pays into the Exchange, for advertising, in proportion to the amount he sells." Through these committees we will organize the whole country, secure the necessary united support. The success of the Stamp Plan will make possible an advertising campaign of such magnitude as has hardly been equalled in this country.

And over-production will worry us no more. We shall see the realization of the truth that no business can be expected to live and prosper without advertising; that the apple business is too big, too important, too valuable, to be allowed to drift about on the commercial sea. Having steadied its course by sound publicity methods, we will have ushered in a new era—an era of strong demand, large consumption, and encouraging price.

THE CANNING OF FRUITS AND VEGETABLES

By Claribel Nye

Leader of Canning Clubs, New York State

CANNING is a form of food preservation by which products in season are sterilized and sealed in air tight containers. From the earliest time food has been preserved. Primitive woman hung strips of meat in the sun to dry. She had never heard of bacteria or the processes of putrefaction or fermentation, but experience taught her that by drying the meat it was possible to keep it for many months to use when the hunter might not be successful in securing a fresh supply.

Today we know many other methods of food preservation—the use of salt, smoke, sugar, oil, sterilization and consequent protection from organisms of the air. Each of these methods is now in use, but the method used in the home and the one which is being developed rapidly as a commercial project is the preservation of food by canning. Many housekeepers take great pride in having the shelves filled with products canned in glass for the winter's use. Fruits and vegetables are canned in tin in canning factories. In 1907 the output of canned peas alone was valued at $14,659,000.

It is well for the health of our people that the dietary include a generous supply of fruits and vegetables, fresh in season and for use canned during the winter and spring months. What is their value in the dietary?

1. Fruits and vegetables supply bulk or ballast to the dietary.

2. Fruits and vegetables add variety and flavor to the dietary, factors too often overlooked but very important in stimulating digestion.

3. Fruits and vegetables aid in maintaining the neutrality of the blood thus helping to prevent such disorders as rheumatism and acidosis.

4. Fruits and vegetables supply mineral matter necessary for the building of tissues and bones.

5. Fruits and vegetables are nature's natural body regulators and aid in keeping the digestion in good working order. The condition of constipation may be relieved often by a dietary which includes a generous amount of fruits and vegetables.

There are certain principles underlying all canning and preserving. If these are understood the process becomes simple and failure can only be due to poor rubbers, imperfect jars or insufficient sterilization. Fruits, most housekeepers agree, are easily canned. Vegetables with the exception of tomatoes are supposed to be practicably impossible to can successfully. However, it is possible to can all vegetables as well as all fruits. Spoilage is due to the action upon the product of some living organism. That organism may be too small to see without the aid of a microscope, nevertheless no canned peaches ever fermented, no jelly ever was found to have mold on its surface, no can of peas ever putrefied that living organisms—yeasts, molds or bacteria—were not responsible for the change. These organisms are very important in producing many desirable changes

in food. It is a yeast which is used in bread-making ; mold gives flavor to certain cheeses, buttermilk tablets are cultures of bacteria. Although these organisms are very useful in many processes, they are the cause of trouble and failure in canning. Therefore all foods to be successfully freed from these organisms should be thoroughly sterilized.

Primitive woman was able to keep meat by drying it because organisms do not grow without the presence of moisture. Salt, concentrated sugar solution, or oil also do not form the proper medium for their growth. Thus food may be preserved by the use of these materials. Other conditions unfavorable to the growth of yeasts, molds and bacteria are extremes of temperature. Thus eggs are preserved in cold storage and fruits and vegetables are sterilized or boiled in canning. If after sterilization the material is completely sealed to prevent the entrance of air which may contain living organisms, all fruits and vegetables may be kept for months or years without "spoiling."

Vegetables present a more difficult problem in canning than acid fruits. Certain bacteria assume not only a vegetative or active stage in which condition they are easily destroyed by the boiling temperatures of water, but under unfavorable conditions they may assume a resting or spore stage. The spores are able to resist the boiling temperature of water for a limited time. Thus vegetables on which are found very resistant spore-forming organisms, have "spoiled" when canned by the directions used in canning fruits.

There are two methods used in canning fruits and vegetables. They are known as the open kettle method and the cold pack method. The open kettle method is the old way of cooking fruits or vegetables in a kettle and pouring them into the cans which are then sealed. The more modern method, also used commercially, consists in packing the products in sterilized cans and filling the cans with water or sirup. The cans are then placed in a wash boiler or canner surrounded with water and boiled or sterilized. By the latter method products retain their form, color and flavor better than is possible when the open kettle process is used. It is also suggested that in the cold pack method directions for blanching be followed (See Bulletin No. 69 Canning Clubs in New York State, Reading Course for the Farm Home, New York State College of Agriculture).

Fruits are generally canned in a sirup. In determining the density of sirup to be used with fruits the personal equation may be the determining factor.* There is no doubt that fruits canned in a light sirup retain natural fruit flavors much better than fruits which are canned in heavy sirup. From a dietetic standpoint lighter sirups are to be preferred. Concentrated sugar solutions are irritating to the digestive tract and if eaten in large quantities may flood the system and be detrimential to health. However, canned fruits are eaten with other food and even if they are very rich with sugar they should not injure the normal healthy individual.

Economically fruits and vegetables in New York State should be canned. Every year, from various causes large quantities are wasted which might be canned for home use or sold to railroads, hotels, boarding houses, groceries or to private trade. There is a market for fruits and vegetables canned in glass and the ambitious boy or girl, man or woman on the farm, if there is available time, has an opportunity to develop a profitable home industry from products which in many parts of the state are a total loss. To be successful boys and girls not only must understand canning, but they must have initiative, ambition and business ability. With these characteristics there should be an opportunity for profitable home canning.

THE CORNELL COUNTRYMAN

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Farmers' Week

Farmers' Week is the one week of the year when the farmers of New York State have a real opportunity to come into close contact with *their* College of Agriculture. Speaking for the students, the COUNTRYMAN is delighted to welcome our visitors. We are glad for many reasons to have you come. You will have the chance of seeing for yourself that the appropriations your representatives are making for the growth and support of this institution, are really worth while. By attending the lectures, conferences, laboratory practices, and demonstrations, you will get just a small touch of what your sons and daughters are obtaining here, not to speak of the benefits you, yourself, will receive. The privilege of meeting and talking with the members of the faculty of the college and so many other farmers who are interested in the same things you are, and who have similar problems to face will be invaluable to you.

During the week the faculty, students and equipment of the college are entirely at your service. Do not hestitate to make the best use of them.

The Value of Fundamental Training

In these days when technical schools are attended by multitudes of students, much emphasis has been given to the practical side of vocational training; the importance and value of a training in fundamental principles apparently has been placed in the background. No doubt this is the result of the inherent desire of mankind to get the largest possible returns from the least possible effort and delay. Taking the average undergraduate at Cornell the tendency is shown by the desire to eliminate those courses giving non-practical work and to take those which show how to make ten dollars profit from a product which gave only five before.

Professor Browne of the Department of Chemistry fittingly pointed out the value of fundamental training in an address before those attending the Agri-

cultural banquet last December. It is absolutely essential and almost imperative, as Professor Browne points out, that a student should have a training in the basic sciences before he can comprehend the complex mechanism on which the more advanced subjects depend. To illustrate he cited how a knowledge of chemistry was necessary before botany, soil technology, or dairy could be properly understood.

The mastering of fundamental courses does not give direct money results, and, moreover, they are said to be easily forgotten. But the person who has been trained in fundamental work can not totally forget, because the principles thereafter are self-evident. It behooves every Cornell undergraduate to see that he has a thorough training in the fundamental courses of the University; then with this knowledge as a firm foundation build a super-structure of practical knowledge. So-called practical training without a broad basis of fundamental training is like a house built on sand.

Elections to the Staff

We wish to announce the election of the following men as Associate Editors, to the CORNELL COUNTRYMAN staff: J. R. Du Floo, '17, J. L. Edwards, '17, J. S. Shanly, '18, and H. S. Sisson, '18. We wish also to thank T. A. Muir, '18 and M. H. Field, '18, for the excellent work they did in the competition.

Our Covers

To Miss Annette J. Warner of the Art Department of Home Economics belongs much praise for the splendid work she has done in designing the covers for the recent issues of the COUNTRYMAN. She has given generously of her time and energy in supplying a long felt need—that is, attractive and artistic covers. The COUNTRYMAN staff takes this opportunity to thank her and to express its appreciation for her invaluable assistance.

The picture on the January cover was a photograph of a noted French picture by a famous French artist. It is evident from the many inquiries we have had regarding it that it does not need a French-English dictionary to translate it into the American consciousness. Every country lover recognizes this every day scene when the long horizontal shadows lie along the road when the air is filled with a misty radiance and "the kine come hame." We all know just such grassy roads—just such wide fields—just such rounded masses of trees—just such still water reflecting the sky. As a picture of animals, how much more the artist has put into it than a mere photograph could convey. Note how many different views of cows are represented and how many different phases of cow nature from the calm meditative creatures standing knee deep in the water drinking and switching their tails, to the exasperated moolie when patience with the frisky dog has at last been exhausted.

Constant Troyan was one of a group of French artists who discovered beauty in the common every day landscape, and in the homely scenes of every day country life. Animal life interested him particularly and almost all his landscapes are enlivened by the presence of animals. When he died he left a large part of the money which he had acquired for the use of young artists, who were especially interested in the painting of animals, as he had been, and who were struggling for an education.

To Get Better Service

Manufacturers and distributors of agricutural supplies are desirous of reaching the college trained farmer. Tell them that you saw their advertisement in the COUNTRYMAN. It will mean better service to you and will help us.

STUDENT ACTIVITIES IN THE COLLEGE OF AGRICULTURE

Cornell, Cornell, Cornell, Cornell, Cornell Ag.—Cornell Culture,
Cornell, I yell, Agriculture.

PART II

By James E. Rice, '90

Professor of Poultry Husbandry, assisted by Harry Knight, '13, and J. R. Du Floo, '17

THE agricultural student athletic activities are well epitomized in the college yell. The slogan reflects the spirit and the motive which inspires the agricultural students to participate actively in athletic sports. The four long-drawn-out repetitions of the word "Cornell", that introduces the yell, rings true loyalty to the University and the name of the one whom all desire to honor. Then follow the words "agriculture" and "culture", representing the broad technical and cultural field which modern agricultural education provides. The yell closes with "agriculture", which allows emphasis to be placed upon the college which it represents. The yell was adopted in 1912 as the result of a spirited competition in which many yells were submitted and tried out before the agricultural students, assembled for an "athletic rally". G. M. Butler, 1912, won the medal which was awarded to the person suggesting the yell that best met the approval of the student body.

The athletic activities of the agricultural students are in three principal fields: University athletics, inter-college sports, and out of door recreation events in which different departments, clubs, or other groups of students participate informally.

An attempt is made, in this article, to bring together the names of the agricultural students who have represented the University in the various sports, in so far as the records available will permit. The fact that there does not appear to be a record available, giving the names of the students who have participated in the different athletic sports since the founding of the University, or a record showing the college in which the students who have won athletic honors were registered, makes it impossible, at this time, to present a complete list of the agricultural students who have contributed to the honor and the glory of Cornell in this particular field of University activities. However, a list is here submitted as a contribution toward a complete record, which may be secured by the co-operation of all who are interested in making an accurate history of the athletic achievements of those who have contributed to the splendid record which Cornell has made in the University athletic world.

The fact that Cornell athletics presupposes good scholarship and that this spirit dominates the policy of all of the coaches who have the direction of the students' athletic development, makes the honor greater on the part of all who have participated in University athletics. It is an honor in which all Cornellians should rejoice, that, wherever her fame has spread, Cornell is known as a University maintaining high standards of honor in athletics.

The list of persons and the events in which they participated, which follows, indicates that the agricultural student places first in importance the opportunity of representing the University in athletic events and that he also takes particular pride in doing his part in bringing to his own college such credit as may come from the winning of victories in inter-college sports.

The long list of agricultural students given below, who have contributed to the success of University athletics, is a credit to the enterprise and spirit of those who participated in the contests, and to those who furnished the moral and financial support that made victory possible. The strong, enthusiastic support of the

student body, in many instances, is a determining factor in the success of the contestants. In supporting the teams the agricultural students have always shown a commendable spirit of pride and liberality. The fact that they raised, by subscription, a fund of $600.00 for the purchase of the agricultural college gig, and have provided, in the past five years, $140 00 for the purchase of medals to be awarded to students who have "made the teams"; that they have furnished suits and athletic supplies abundantly for all who desired to compete in intercollege sports; that they have maintained an athletic council to organize and administer college athletic affairs, is better evidence than mere words to show why and how the agricultural students have been so successful in their athletic activities.

THE TYPE OF MEDALS AWARDED TO THE MEMBERS OF THE AGRICULTURAL INTER-COLLEGE TEAMS

AGRICULTURAL STUDENTS WHO HAVE PARTICIPATED IN UNIVERSITY ATHLETICS AND SOME OF THE SPECIAL HONORS WHICH THEY HAVE WON.

Baseball

Number of persons participating—16.

Name	Years in Event	Special Honor
Brinkerhoff, H.E., '06		
Bryant, T.V.'15	(1) (3)	C
Carter, H.N., '17	(1)	Numerals
Deshon, J.J., '07	(2)(3)(4)	C
Grossman, M.H., '14	(2)(3)(4)	C
Hobson, A.T., '15		Numerals
Knowles, G.W., '15		Numerals
Ludwig, E. E.'16		Numerals
O'Connell, G.M., '17		Numerals
Oyster, G.H., '11	(2)	Numerals
Perkins, R.F., '17		Numerals
Prichard, L.V., '12		Numerals
Roy, C.A., '15		Numerals
Rutherford, J.H., '10	(4)	C
Ward, D.D., '12	(2)	Numerals
Watson, S.H., '13	(1)	Numerals

Football,

Number of persons participating—24.

Austin, B.H., '12	(4)	C
Bailey, C.W., '16	(3)	C
Bates, E.S., '13	(2)	C
Bayer, Edw D., Sp. '09	(3)	C
Bell, F.W., '11	(2)	C
Cook, G.T., '08	(1)(2)(3)(4)	C Captain
Cool, W.C., '16	(1)(2)(3)(4)	C
Donnan, G.S., '09		
Earle, Edwin, '08	(1)(2)(3)(4)	C
Frick, A.J., '16	(2)	C
Gallogly, E J., '15	(3)(4)	C
Jameson, W.H., '16	(3)	C 2d
McCutcheon, J.D., '16	(1)(2)	Numerals
Mehaffey, A.B., '15	(1)(3)(4)	C
Newhall, J., '06	(3)(4)	C

O'Hearn, J.E.,'15	(1)(2)(3)(4)	C Captain
Otis, J.C., '01	(2)	C
Shuler, C ,'15	(1)(2)(3)(4)	C
Stevenson, W.G.		
Stimson, S.N., '12	(3)	C
Sweetland, E.R.,'99	(3)	C
Tilley, C.,'17	(1)(2)	C
Wood, B.B.,'11	(2)(3)	C
Younglove, J.R.,'16	(1)	Numerals

Association Football or Soccer.

Number of persons participating—10.

Birkhahn, G.B.,'11	('08)('09)	
Bishop, S.C.,'13		
Cotton, R.T.,'14		
Creifelds, W.,'15		Captain
Nicolai, F.,'17		
Thomas, F.H.,'16		Captain
Lynch, H.,'15		
Otis, J.C.,'13		Insignia
Smith, L. B.,'14		
Wilson, W de Sid,'13		

Basket Ball.

Number of persons participating—2.

Brown, L.,'16		C
Lyford, P.S.,'06		Captain

Tennis.

Number of persons participating—1.

Burlingame, G. G.,'07

Lacrosse.

Number of persons participating—11.

Burt, G.J.,'11		
Collins, C.P.,'16		C
Dean, A. L.,'13		C
Fries, W.H.,'11		
Grimes, A.M.,'15		C
Johnson, L.W.,'06		C
Kraker, J.L.,'12		
Lawles, H.D.,'14		C
Osgood, H.M.,'15		Insignia
Spiegelberg, F., '15		C
Taylor, H.H.,'15		C Captain

Hockey

Number of persons participating—2.

Hunter, F.T.'16	(2)(3)	Insignia
Smith, L.B.,'14	(2)(3)	Insignia

Cricket

Number of persons participating—2.

Smith, L.B.,'14		Insignia
Sonnenfeld, H.,'12		Insignia

Golf

Number of persons participating—1.

Mathews, W.A.,'15	(2)(3)	Insignia Captaiu

Track

Number of persons participating—38.

Baker, W.C.,'98	(4)	C
Brogg, L.D.,'12		
Burgdorff, F.J.,'12		
Caldwell, D.S.,'14	(4)	C
Cook, G.T.,'08	(1)(2)(3)	C
Corwith, J.C.'16		C
Hageman, H.W.,'13		
Haselton, W.D.,'12	(2)	Numerals
Hitchock, R.W.,'10		
Howard, L.,'17	(1)	Numerals
Humphrey, H.N.,'11	(2)	Numerals
Irish, H.E.,'16	(2)	Numerals
King, C.J.,'15		Numerals
Lawrence, R.J.,'13		
Leister, C.W.,'17	(1)	Numerals
Lukens, A.L.,'15	(1)(2)	Numerals
Lynch, H.,'15		Numerals
Millard, H.E.,'16	(2)	C
Morrison, H.,'14	(4)	C
Munns, J.H.,'14		Numerals
Nicholas, G.L.,'15	(1)	Numerals
Osler, F.B.,'17		Numerals
Phillips, J.H.,'10	(2)	Numerals
Pickerill, H.N.,'11		
Porter, F.J.,'05	(2)(3)(4)	C
Richards, A.W.,'17	(1)	Numerals
Rossman, R.L.,'09	(2)(3)	C
Stein, C.J.,'09		
Talbot, L.J.,'11	(2)	Numerals
Taylor, G.M.,'16	(2)	Numerals
Townsend, T.H.,'17	(1)	Numerals
Treman, L.C.,'14	(1)(2)	Numerals
VanKleek, J.R.,'12	(2)(3)	Numer. C
VanWinkle, A.F.,'16	(1)(2)	Numer. C
Warner, I.S.,Sp.'15	(2)(3)	Numer. C
Wheeler, R.A.'17	(1)	Numerals
Whinery, J.E.,'14	(3)(4)	Numer. C
Young, H.C.Sp.,'10	(2)(3)(4)	Numer. C Captain

Cross Country.

Number of persons participating—14.

Burke, Frank,'16	(2)	C Numer.
Corwith, J.C.,'16	(3)	C
Heath, C.O.,'17	(1)	Numerals
Kraker, J.L.,'12	(4)	C
Lamb, G.W.,'13	(3)	C
McGolrick, J.E.,'14	(3)	C
Peet. N R.,'10	(2)	Numerals
Stevenson, S.H.,'12	(2)	C
Stewart, P.F.,'16		Numerals
Sullivan, F.F.,'15		Insignia
VanKleek, J R.,'12		C
Wheeler, H.B.Sp.'17	(1)	Numerals
Windnagle, L.V.,'17	(1)(2)	C
Young, H.C. Sp.,'10	(2)(3)	C

Wrestling.

Number of persons participating—9.

Bame, C.F.,'13		C
Bame, W.C.'12		
Dragoshinoff, D.G.,'07		
Embleton, H.,'12		
Gallogly, E.J.,'15	(3)	C Captain
Green, S.S., '15	(2)	C
Lewis, S.R.,'14	(2)(3 (4)	C Insig.
Stimson, S.N.,'12		
Stokoe, W.C.,'13	(3)(4)	C Insig. Inter-col. champ.

Fencing.

Number of persons participating—1.

Harries, W.E.,'08	Captain

Swimming.

Number of persons participating—4.

Bowers, W.J.'15	(2)(3)	Insignia
Hamilton, G.H.,'12		Captain
Kohn, N E.,'14		Insignia
Walker, H.W.,'13	(4)	Insignia

Crew.

Number of persons participating—39.

Bailey, C.W.'16		Numerals
Bates, E.S.,'13	(2)(3)(4)	CommodoreC
Bayer, E.I.,Sp.'09	(2)(3)	C
Bentley, G.E.,'12		Sin. Scull Champ.
Bird, E.S.,'14	(3)(4)	C
Brinckerhoff, A.F.,'02	(2)	C Captain
Butts, W.W.,'15	(2)	C
Chapman, L.K.,'13	(3)(4)	C
Dole, E.H.,'13		
Elliott, C.H.,'13	(3)	C
Ellms, W.V.,'15	(3)	Commodore C
Elstern, V.,'82	(1)	Cox.
Fernow, K.'16	(2)	Insignia
Gilman, A.R.,'16	(2)	Captain C
Gracy, L.R.,'08	(2)(3)(4)	C
Jeffers, H.W.,'98		C
Johnston, W.,'13	(3)	C
Kelley, F.B.,'10	(1)(2)(3)(4)	C Numer.
Keyes, H.F.,'14		Numerals
King, A.C.,'99	(1)(2)(4)	C
King, T.H.		C
Lueder, C.A.,Sp.'03	(2)	C
Meyers, H.A.,'17	(1)	Numerals
Morgan, D.S.,'17	(1)	Numerals
Munn, J.H.,'13	(2)(3)	C Numer.
Perry, L.C.,'13	(2)	C
Pollard, E.L.,'15	(1)	Numerals
Reeve, R.C.,'13		
Reichert, C.J.'17	(1)	Numerals
Ross, J.D.'90		
Seymour, E.L.D.,'09	(2)	C
Small, J.H.,'13	(2)	C
Stimson, S.N.,'12	(1)(4)	Numerals Insignia
Stonle, A.,'04	(2)(3)(4)	C
Sweetland, E.R.,'99	(3)(4)	C
Towers, A.C.,		Captain
Troy, H.C.,'96	(1)(2)(3)(4)	C Captain
Wilcox, F.E.,'83	(4)	C
Wurst, F.E.,'09	(3)(4)	C Numer.

Summary showing number and nature of events in which Agricultural students participated.

Baseball	16
Football	24
Soccer	10
Basket Ball	2
Tennis	1
Lacrosse	11
Hockey	2
Cricket	2
Golf	1
Track	38
Cross Country	14
Wrestling	9
Fencing	1
Swimming	4
Crew	39
Total	174

Number of persons participating in University sports (eliminating duplications where persons participated in more than one type of sport): 161.

The following tabulations show the rating of the Agricultural College in the various inter-college athletic events and the inter-college championships.

Soccer.

Year.	Winning College.	Ag's Position.
'08-'09	M.E.	4th
'09-'10	C.E.	2nd
'10-'11	Agr.	1st
'11-'12	C.E.	3rd
'12-'13	M.E.	3rd
'13-'14	Agr.	1st

Cross Country.

Year	Winning College	Ag's Position
'06-'07	C.E.	
'07-'08	M.E.	
'08-'09	M.E.	4th
'09-'10	Agr.	1st
'10-'11	M.E.	2nd
'11-'12	Agr.	1st
'12-'13	Agr.	1st
'13-'14	Agr.	1st

Basket Ball.

'06-'07	Law	
'07-'08	C.E.	
'08-'09	C.E.	2nd Tie for 2nd
'09-'10	Law	Agr., CE., Arts
'10-'11	Law	4th
'11-'12	Law	3rd
'12-'13	C.E.	2nd
'13-'14	C.E.	3rd

Carnival.

'08-'09	Vet.	4th
'09-'10	Arts	4th
'10-'11	Agr.	1st
'11-'12	Agr.	1st
'12-'13	Agr.	1st
'13-'14	Agr.	1st

Track.

Year.	Winning College.	Ag's Position.
'06-'07	M.E.	
'07-'08	Arts	
'08-'09	M.E.	3rd
'09-'10	M.E.	4th
'10-'11	C.E.	2nd
'11-'12	M.E.	2nd
'12-'13	Agr.	1st
'13-'14	Agr.	1st

Baseball.

'05-'06	C.E.	
'06-'07	M.E.	
'07-'08	Law	
'08-'09	Law	7th
'09-'10	C.E.	4th
'10-'11	Agr.	1st
'11-'12	Agr.	1st
'12-'13	C.E.	2nd

'13-'14	Agr.	1st
	M.E.	1st

Crew.

'05-'06	C.E.	
'06-'07	C.E.	
'07-'08	Arts	
'08-'09	Arts	6th
'09-'10	Agr.	1st
'10-'11	Agr.	1st
'11-'12	Law	2nd
'12-'13	M.E.	2nd
'13-'14	Agr.	1st

Inter-College Championships.

'08-'09	C.E.	4th
'09-'10	C.E.	2nd
'10-'11	Agr.	1st
'11-'12	Agr.	1st
'12-'13	Agr.	1st
'13-'14	Agr.	1st

Final Standing of the Different Colleges for the Championship Trophy.

	Agr.	Arch.	Arts.	Chm.	C.E.	Law	M.E.	Vet.
'08-'09	35	14	34		49	30	40	17
'09-'10	43⅓	11	32½		48½	28	39	18
'10-'11	58	13	23		38⅚	31⅓	39	18½
'11-'12	49	9¾	20¼		34	28¾	40¾	17½
'12-'13	52	12½	17	9	42	18½	37	14
'13-'14	58½	8	26	13½	37½	14	37½	10½
	295⅝	68¼	152 7/12	22½	249 8/15	150 7/12	233¼	95½

The large and rapidly increasing number of students in the agricultural college, as well as the athletic prowess of the students, is an important factor in the inter-college sports. The difference in number of students in the different colleges must be taken into consideration in comparing the results of all inter-college athletic contests. The agricultural students recognize and pay high tribute to the enthusiasm and the pluck which is manifested by the students in the colleges in which, on account of less numbers, they are seriously handicapped. The finest test of athletic mettle is the spirit with which a team enters contests in which it competes against larger numbers.

The splendid spirit of friendly rivalry that has, from the very first, prevailed among the students in the many colleges, particularly in the inter-college sports, is a source of satisfaction and pride on the part of all Cornellians.

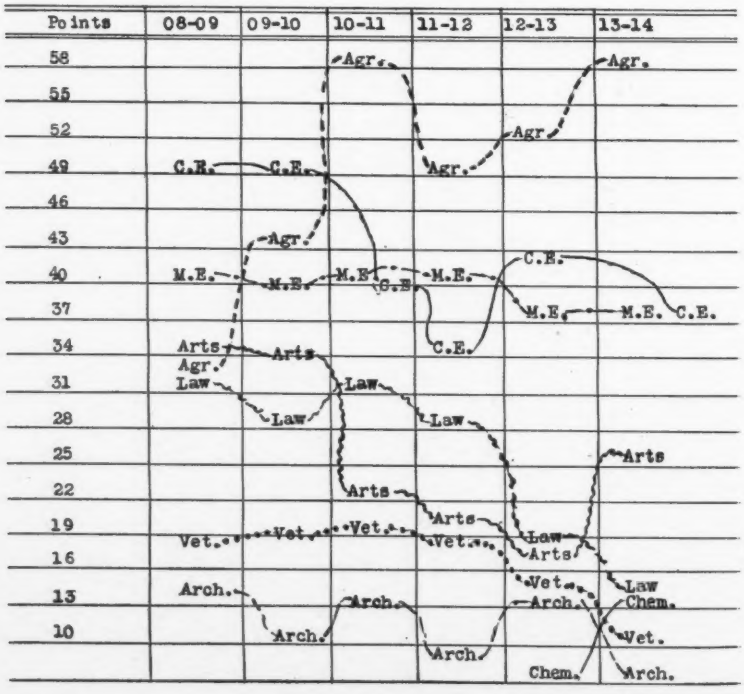


CHART SHOWING THE RELATIVE PROGRESS OF THE COLLEGES IN INTERCOLLEGIATE ATHLETICS

CAMPUS NOTES

The Pomology Club

The Horticultural Lazy Club of which the Pomology Club is one of the offsprings, is the oldest club in the Agricultural College, the first meeting of the Club being held in Nov. 1896. Former Dean L. H. Bailey was at that time Professor of Horticulture and the leading spirit in the forming of the club. In fact he was godfather to the club title which represented to him, so he said, one of the leading traits of a few of his students. This club was out of the ordinary in that there was no organization, no president, secretary, or minutes of the last previous meeting, just an informal gathering of students and faculty to discuss some topic of horticultural interest. Many men, who were members of this club, have made reputations for themselves: John Craig, F. A. Waugh, G. Harold Powell, H. P. Gould, Bryant Fleming, R. M. Curtis, W. C. Baker, G. N. Lauman and a host of others. The club itself has had a certain influence on the horticulture of the country, notably the adoption by the American Pomological Society of the rules of nomenclature, as discussed and recommended by this club. The traditions of the old Lazy Club are still cherished by the oldest graduates and its influence is felt by the branch clubs that have been formed by the separate interests of the Pomology, the Floriculture and the Vegetable Gardening sections.

The Pomology Club is an organization of students interested in any of the phases of Pomology. The membership is open to all and is not permanent. The club meets as regularly as possible every two weeks in room 202, Roberts Hall. During the last term an average of about 40 students have attended each meeting.

At the beginning of each semester new officers are elected. For the first term the officers were, R. C. Parker, Sp., president, F. P. Metcalf, Grad., vice president, and A. J. Heinicke, advisor. One of the members is elected as a representative on the Agricultural Executive Committee. The representative for the first term was L. J. Steele, '15.

Professor C. S. Wilson addressed the club at the first meeting. The plans for the Fruit Exhibit of the Department of Pomology were discussed. The Exhibit was held Nov. 5–7 and the second meeting was held in connection with it. Different members made reports on fruit growing in their home districts. At the next meeting Assistant Professor H. B. Knapp discussed the new Apple Packing, Grading, and Branding Law. The fourth meeting was taken up by reports from the members on yields, markets, and market conditions in different localities. The following meeting was held in connection with the Floriculture section. Assistant Professor Lumsden spoke on the relation of Floriculture to the people of New York State. An address on Tropical Horticulture by Director B. T. Galloway was the principal feature of the next meeting. At the last meeting

Professor Whetzel gave an illustrated talk on his experiences in Europe. A discussion of the Annual Convention of New York State Fruit Growers held in Rochester, January 6–8, followed this talk.

The Cornell Fruit Judging Team

The fruit at the Convention of the N. Y. State Fruit Growers' Association, held in Rochester, January 6–8, was judged by a team picked from the Pomology 8 class. The team consisted of E. R. Wagner, '15; L. J. Steele, '15 and R. C. Parker, Sp., who were selected by a competition based largely on several identification tests.

Quite a considerable amount of fruit was judged with little difficulty, until the large entrees of Baldwins and Spys offered the most preplexing problems.

The Musical Clubs

The Cornell University Glee, Banjo, and Mandolin Clubs had a very successful trip during the Christmas recess. After leaving Ithaca, the clubs proceeded to Denver where the first concert was given. From Denver the clubs returned to the East, stopping to give concerts at Omaha, Kansas City, St. Louis, and Milwaukee, on January 1st, a concert was given in Chicago. The next stop was Toledo. The final concert was given in New York on January 4th.

The following Agricultural students took the trip:—C. S. Whitney, Grad., A. T. Hobson, '15, President of the clubs, L. C. Barnum, '15, F. W. Cady, jr., '15, J. D. Holmes, '15, W. S. Marsland, '15. O. P. Morse, A. N. Rogers, '15, G. A. Haskins, '16, L. F. Hicks, '16, A. F. Griesedieck, '16, J. D. McCutcheon, '16, R. E. Perry, jr., '17, W. V. N. Carver, '18, M. D. Clapsattle, Sp., R. W. Pease, Sp.

Changes in the Agricultural Buildings

Some important changes have been made in the arrangement of departments in the main building. The completion of the new Soils Building has given an opportunity to make several much needed shifts. Some departments were crowded while others had more space than could be used to best advantage.

The agricultural library is to be changed from its place on the first floor of Robert's Hall to the basement of the old Agronomy building. The space now occupied by the library will be taken by the Secretary's office. The information department will occupy the rooms now used by the Extension department at east end of the first floor of Roberts Hall. On the second floor, the Farm Bureau is to have the entire east end. The Soils Laboratory on the second floor of the old Agronomy building will be divided and used for Botany and Farm Crops.

Departments in some of the other buildings will also be changed. The Department of Farm Management is to be changed to the old Animal Husbandry building. Vegetable Gardening is to go to the Poultry building. The departments of Farm Mechanics and Rural Education are to be housed in the new Soils building. The Head greenhouses are being remodelled into offices and classrooms for Floriculture.

New Ag Report System

The report system which was adopted at a Faculty meeting last June is being used at the present time. The new system affects only students in the College of Agriculture. The chief change is that the reports are to be made out twice a year on December 1 and April 1. Each professor or instructor will make out the reports for the students in his classes. Copies of the cards are sent to the student and his advisor. Only students whose marks are under 65 are affected.

Besides the name of the student and the subject taken there are on the card spaces for data on the following points: health, methods of study, initiative, expression, industry, pre-

vious preparation, daily preparation, attendance, and ability. A note is made if too much time is apparently being spent in outside activities. The instructor fills out these blanks according to where the student is deficient and adds any remarks he may wish to make about the student. These reports are kept on file in the Secretary's office.

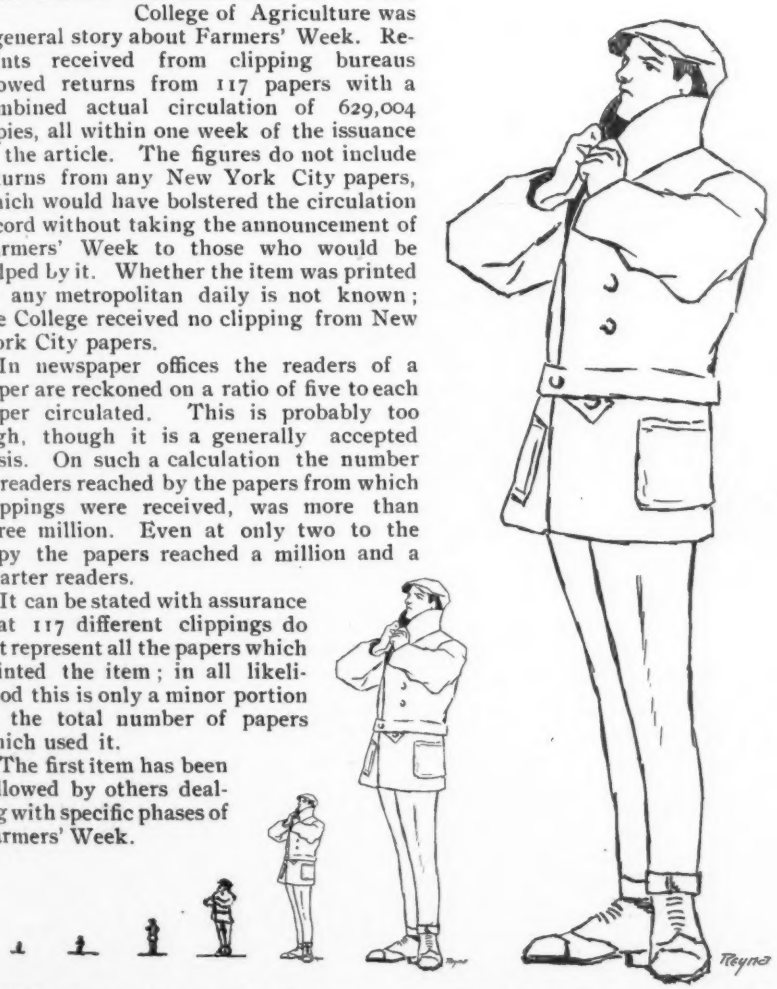
The Information Service

The first news item issued by the recently established information service for the College of Agriculture was a general story about Farmers' Week. Reprints received from clipping bureaus showed returns from 117 papers with a combined actual circulation of 629,004 copies, all within one week of the issuance of the article. The figures do not include returns from any New York City papers, which would have bolstered the circulation record without taking the announcement of Farmers' Week to those who would be helped by it. Whether the item was printed by any metropolitan daily is not known; the College received no clipping from New York City papers.

In newspaper offices the readers of a paper are reckoned on a ratio of five to each paper circulated. This is probably too high, though it is a generally accepted basis. On such a calculation the number of readers reached by the papers from which clippings were received, was more than three million. Even at only two to the copy the papers reached a million and a quarter readers.

It can be stated with assurance that 117 different clippings do not represent all the papers which printed the item; in all likelihood this is only a minor portion of the total number of papers which used it.

The first item has been followed by others dealing with specific phases of Farmers' Week.



Graphic representation showing the increase in enrollment in the College of Agriculture.

YEARS AND TOTAL NUMBER OF STUDENTS						
1868–9	1888–9	1893–4	1898–9	1904–5	1909–10	1913–14
30	60	115	191	418	967	2,557

FORMER STUDENT NOTES

Former Students—Your classmates are anxious to know what you are doing. Write today, giving us some information about your work.

'07, Ph.D—J. Eliot Coit, COUNTRYMAN Editor '05-'06, writes as follows: "After receiving my doctor's degree at Cornell in 1907, I went to the University of Arizona as Associate Horticulturist of the Experiment Station. I was engaged for two years in studying the horticulture of southern Arizona, California, and Sonora, and some of the results of these studies appeared in the annual reports of the Experiment Station and as Bulletin No. 58 on Citrus Fruits, Timely Hint No. 78 on pruning deciduous orchards, and Bulletin No. 62 on Olive Culture and Oil Manufacture.

"In 1909, I moved to southern California becoming connected with the University of California's Pathological Laboratory at Whittier in Los Angeles County. My studies in citriculture were continued here and I became interested also in walnuts, avocados and a number of other semi-tropical fruits. I was much interested in the development of the date industry, having spent a great deal of time studying at the cooperative date orchards at Tempe, Arizona. The knowledge gained of desert agriculture finally led to the publication of California Experiment Station Bulletin No. 210 entitled Imperial Valley Settlers' Crop Manual. This was published in conjunction with Mr. Walter E. Packard in charge of the Experiment Station in the Imperial Valley.

"On February 1, 1912, I was made Associate Professor of Pomology in the University and appointed Superintendent in charge of the Citrus Experiment Station at Riverside. The

J. ELIOT COIT, PROFESSOR OF CITRICULTURE, UNIVERSITY OF CALIFORNIA, WITH CLASS MAKING EXPERIMENTAL LOTS OF OLIVE OIL

Professor Coit is standing in the centre of the picture with his hand on the press

work of the Station was immediately reorganized and the present buildings were constructed during my superintendency. On January 1, 1913, I was appointed Professor of Citriculture and head of a new division of Citriculture in the University of California. I moved with my family to Berkeley, and have since been engaged in developing undergraduate and graduate courses in Citriculture and Semi-tropical Pomology. The Division of Citriculture includes in its field the citrus fruits and all other semi-tropical fruits including dates, olives, figs, avocados, feijoas, mangoes, pomegranates, persimmons, cherimoyas, as well as bananas and many others of lesser importance. The Division also gives instruction at the Farm School at Davis, and its plantings of semi-tropical fruits are made at Davis, the climate at Berkeley being not suitable for this purpose.

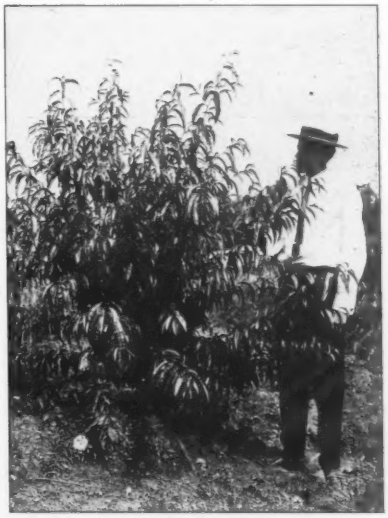
"One of the features of the instruction work given is a summer practice course conducted for six weeks throughout the citrus districts in California. From fifteen hundred to two thousand miles are usually covered and a large number of the best citrus and semi-tropical fruit properties in the State are visited and studied. As much actual practice work as is possible is secured.

Soon after leaving Cornell in 1907 I married Miss Emily A. Hanna of Raleigh, N. C., and we now have two daughters aged three and five.

Have prepared and offered a Correspondence Course in Citrus Fruits in which 1400 students are enrolled".

He has just completed "Citrus Fruits", Rural Science Series, edited by Prof. Bailey and published by McMillans, now in press.

'13, B.S.A.—E. C. Auchter graduated from Cornell February 7, 1912, and immediately accepted a position at the West Virginia University and Agricultural Experiment Station as Assistant Horticulturist in the Experiment Station and Instructor in Horticulture in the College of Agriculture. He was raised to the rank of Assistant Professor of Horticulture on September 1st, 1914, in the same University. Auchter is especially interested in the Pomological side of Horticulture, teaching the practical and commercial phases of this work in the University, as well as doing much of the experimental work in the field. At present many valuable experiments on orchard running, spraying, fertilizer, culture and variety tests are under way at the West Virginia Agricultural Experiment Station. Orchard surveys with some costs of production have been completed in two of the foremost fruit counties of the state and will soon be published.



MR. AUCHTER STANDING BY A PEACH TREE, WHICH IS SHOWING EXCELLENT RESULTS FROM THE APPLICATION OF POTASH, PHOSPHORIC ACID AND NITRATE OF SODA

'06, F. E. Peck—One year of graduate work, in Dairy Bacteriology and Nature Study. During graduate year, was acting manager of Sage College. The two years following, taught Agriculture and Sciences at Mt. Hermon School, Mass.; resigned and took position with the Fairfield Dairy Co., of Montclair, N. J., the originators of, and probably the

largest dairy now producing certified milk. For two years was Chemist and Bacteriologist with the company. The next two years were spent in the South, a short time as head of the Agricultural department of the Berry School, Rome, Ga., which position was resigned to take up duties of Chemist and Bacteriologist with one of the largest commercial dairy companies of the South, the Clover Farm Dairy of Memphis. One of the

A 7½ YEAR OLD TREE ON MR. ANDERSON'S FARM WHICH BORE 4 BUSHELS OF "A" GRADE APPLES LAST FALL

things the company desired was a way to profitably dispose of their surplus skim milk. Ascientifically prepared buttermilk was therefore put upon the market which quickly took up the surplus milk and called for more. The Southerners being lovers of fermented milks. The position now occupied and held for the past two years is with the Wilbraham Academy, Wilbraham, Mass., as business manager of the institution, which also includes a farm of some 250 acres.

'08, B.S.A.; '10, M.S.A.—E. H. Anderson writes us the following letter: In 1908, I graduated from the Agricultural College, B.S.A. degree, and secured M.S.A. in 1910. From April, 1908 to Nov. 1911, I was working my father's farm at Hilton, N. Y. on share rent basis. In April, 1912, I purchased the farm in Hilton and have since been conducting it along with my other business.

In the Fall of 1911, I took the position of Secretary and Fruit Expert to the Bedford Farmers' Cooperative Ass'n, Mt. Kisco, N. Y., having the supervision and care of orchards for the season, and in the summer of 1912, supervised the erection and operation of an evaporator and cider mill, and the packing and marketing of the apples of the Association.

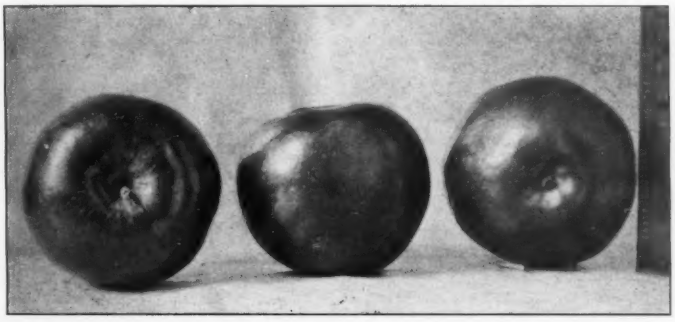
In March, 1912, I accepted the position of Farm Bureau Mgr. of Niagara County. Owing to the importance of the fruit industry in Niagara County, a large portion of my time has been spent in orchard problems. Pruning, spraying, cultivation, the selection of varieties for young orchards, and packing and marketing of the fruit, all demand my attention in their order.

In cooperation with Mr. Scovell, of the United States Dep't. of Agriculture, we have just completed a Farm Survey of one of the intensive fruit-growing towns of Niagara County. This will give us much valuable information in regard to systems of farm management in this section.

In connection with my other duties, I have carried on a general management of my home farm of 85 acres, of which about one-half is in fruit. Apples are a specialty. Twelve acres of orchards, which in 1908 gave an average yield of 75 barrels per acre, now have averaged better than 100 barrels per acre for the past three years. This has been accomplished by a good system of farm management, and the use of cover crops. By careful attention to spraying, packing and marketing, I have been able to secure a price of from 25 cents to 30 cents per barrel above the price paid for the same variety in that section.

While fruit-growing is my specialty, I am endeavoring to produce all the feed and grain needed for the stock on the farm, besides having some each year to sell. I am raising colts and pigs as a side-line, as I believe it is safer not to tie up too closely to one crop.

I am enclosing two pictures, one of a tree in blossom taken last spring. This tree, one of an orchard planted in 1908, produced 4 bushels of "A" Grade apples in the Fall of 1914, which sold for $2.00 per barrel. The other picture is of a new variety of apples, which originated on my farm, and which I am propagating. It is of deep red color and good size, mildly acid, and ripens with the Tompkins County King. I am testing this variety out in my own orchards, and



ANDERSON APPLE, WHICH ORIGINATED ON MR. ANDERSON'S FARM. TYPICAL SPECIMENS FROM YOUNG GRAFTED TREE; 1909 GRAFT IN BEN DAVIS

and am convinced that it is an apple worth propagating. I believe in the future of the apple and that the new Apple Grading Law, in effect this Fall, is a step in the right direction.

'08, B.S.A.—Lewis A. Toan after graduation returned to his home in Perry, N. Y. Planted 43 acres apple orchard and 13 acres peaches. Total farm acreage about 400. Taught Agriculture in Perry High School nearly two years 1911–12 and 1912–13, looking after farms between times. On April 15, 1913 became manager of Monroe County Farm Bureau with headquarters in the Chamber of Commerce at Rochester. The work has been largely in fruit sections of that County.

'08, Sp.—Mr. H. O. Tiffany has recently accepted a position as manager of the Chippewa Land and Pastures Company, at Nelson, Wis., which is near Minneapolis. It is a tract of approximately 9000 acres which is likely to be increased to 15000 acres. It lies at the junction of the Chippewa and Mississippi rivers and is subject to overflow. He is also the author of a circular on "Cost of Land Drainage" published as Circular 147 of the Ohio Experiment Station at Wooster, which has recently been issued.

Cornell Civil Engineer, 1909, Mr. John R. Haswell, drainage engineer of the Eastern District of the U. S. Department of Agriculture, with headquarters at Baltimore, Md., is author of Bulletin 186, of the Md. Agricultural Experiment Station on "Land Drainage at Maryland". It is an illustrated publication of forty pages. Mr. Haswell took special work in soils and drainage in the College of Agriculture.

'11 B.S.A. '14 M.S.A.—Miss Elizabeth Genung sends us an interesting letter about her work, since she graduated in 1911. It follows:

"The year after I graduated from Cornell I taught Agriculture in the High School at Tully, N. Y. Although there was not very much fruit grown in that section we had a fruit

show and exhibited over ninety plates of apples brought in by the surrounding farmers. The students scored these and the Pomology class at the Cortland Normal also acted as judges for the exhibit.

"The following two years I spent at Cornell working for my M.S.A. degree and assisting in the Bacteriological laboratory of the Department of Dairy Industry. My minor work toward my degree was with the Pomology Department. I tested the cooking quality of the different commercial varieties of apples. I used over twenty different varieties and as a general conclusion found that, an apple of high quality when eaten raw, did not always retain that quality when cooked.

"I received my degree in September 1914 and soon after accepted a position as instructor in Bacteriology and Agriculture in the Iowa State Teachers College at Cedar Falls, Iowa. The college has a registration of about 1800 students. I have been teaching Elementary Agriculture and have started a course in Bacteriology for Home Economics students. Thus far my work has been pleasant and fairly successful." Miss Genung's address is 2303 Olive St., Cedar Falls, Iowa.

'10, Grad.—W. H. Darrow sends us the following letter: "I left Markham, Va., last April 15th and with my partner, H. P. Safford, bought a 75 acre farm in Putney, Vermont. At the present time we have 25 acres plowed and set to fruit—about 1000 apples mostly McIntosh; 350 peaches and enough of cherry, plums, apricot, and quince to make 1500 trees, besides the above tree fruits we have two acres of promising strawberries and one acre of raspberries. We raised potatoes between our tree rows this year and have 900 bu. in the cellar at the present time. This fall we set one row of raspberries between the tree rows after digging the potatoes.

THE BUILDINGS ON MR. DARROW'S FARM ARE IN EXCELLENT SHAPE AND COULD NOT BE REPLACED FOR TWICE WHAT THEY PAID FOR THE WHOLE FARM

"During the summer we purchased another farm of 120 acres and now have 30 acres plowed and ready for planting in the spring. This will take about 1500 apple trees and will be planted largely with McIntosh, Gravenstein, and Northern Spy. If the Spies do not do well they will later be top worked into Kings."

'11, B.S.A.—D. C. Vann is located on a farm of ninety acres situated at Bridgeport, Pa., about twenty miles from Philadelphia, Pa. He is de-

(*Continued on page 414.*)

Former Student Notes

Continued from page 414

veloping a fruit and poultry farm having started operations in the spring of 1913. At the present time having thirty acres planted to peaches and apples, besides a small orchard with a variety of fruits, he also has recently planted about 3,000 bush fruits including blackberries, currants and gooseberries. After a year or two he is planning to set some more trees. He has about 300 laying hens, Barred Plymouth Rocks, most of which were reared on the farm during the past season.

It is his plan to develop a retail market for his produce in the suburban district of Philadelphia, having already started a trade in fancy poultry and strictly fresh eggs.

The other crops which he is growing and their yields are as follows: 250 bu. potatoes, 750 bu. shelled corn, 230 bu. oats, some alfalfa and timothy hay and quite a quantity of truck crops.

'12, B.S.A.—Harry Embleton spent the summer of 1912 on the poultry farm at Ithaca. He then went to Purdue University as instructor in the Poultry Department. He started a wrestling class while there and worked up quite a lot of enthusiasm. In February, 1913, he resigned, taking an interest and an active part on an eighty acre fruit farm at Highland, N. Y. He says, "It seemed good to get back into the fruit work, as I looked forward to a future in this work." However, contract troubles caused him to break relations on June 1st. Since then he has been with the Sharples Separator Co., of Chicago, especially in the milking machine line.

'12, B.S.; '13, Grad.—Mr. E. L. Markell during the year 1912–13, was an instructor in the Department of Pomology at Cornell University. In August, 1913, he accepted a position as Scientific Assistant with the United States Department of Agriculture, Bureau of Plant Industry, Office of Fruit Handling and Transportation. He was first detailed to Georgia on peach work. In the Fall of 1913 Mr. Markell was stationed at Hood River, Oregon in connection with apple storage and handling investigations, and the following winter he was again in Florida engaged in fruit and vegetable handling and precooling investigations. During the following Summer occurred his marriage to Miss Genievive Williams, of Brooklyn, N. Y., Cornell, '13, Grad. In the fall of 1914 he was sent to the North West in charge of the apple investigations there. At the present time he is in Florida in charge of a party engaged in fruit and vegetable investigations. This work includes a study of the cause and prevention of the factors of decay in harvesting and shipping lettuce, tomatoes, celery and other truck crops, as well as citrus fruits and pineapples. The equipment of the party includes a complete portable precooling plant. Mr. Markell has made an excellent record in his work with the United States Department of Agriculture, and is highly regarded by the officials of the Bureau of Plant Industry as well as his co-workers.

'12, B.S.A.—T. M. Sprague left Cornell in February 1913 to take a position as Fruit Expert for the Bedford Farmers' Cooperative Association. The Association maintains and operates three spraying outfits which are for the use of any members who desire such work done. Mr. Sprague has been superintending the operation of these outfits, advising as to fruit problems and superintending the cider mill and apple evaporator.

'12, Special.—Tom Milliman, who has been managing an estate at Timber Point, L. I., has been appointed County Agent of the Farm Bureau in Orange County, N. Y. He was selected from 20 applicants. He assumed his duties on January 1, 1915.

'13, B.S.,—Mr. G. L. Fisher, has been recently appointed by the Bureau

(*Continued on page 416.*)

Former Student Notes

(*Continued from page 414*)

of Plant Industry and Pomological Investigations to receive and inspect experimental lots of fruits and vegetables. He is stationed at New York City and will inspect there the experimental shipments sent from Florida.

'08, B.S.A., M.S.A., 1910, P.H. D., '13—Howard B. Frost went to the University of California in Oct. 1913 for Plant-Breeding research. His official title is Instructor in Graduate School of Tropical Agriculture, Assistant in Citrus Experiment Station. He started some hybridization work with citrus fruits last spring. He already has some work on heredity under way.

On December 22nd the new site for the school station was selected, comprising about 477 acres of land near Riverside, only three or four miles from the present site.

'13 B.S.—Mr. H. G. Honeywell is managing a 176 acre farm at North Branch, N. J. Hay and corn are the principal crops raised.

'13 B.S.—N. D. Steve has bought a 100 acre farm at Montezuma, N. Y. The land is mostly muck, and celery, onions and lettuce will be the main crops. He has been making surveys in the Rural Engineering Dept. for the last two years.

'13 W.C.—Theodore V. W. Swift, who took the winter course in Agriculture, is herdsman on the Woodcrest Farm at Rifton, N. Y., where he has charge of over 150 Holstein-Friesian cattle.

'13 B.S.A.—E. V. Underwood is manager of the Oswego County Farm Bureau. He is at present at work upon a bulletin, showing lack of lime in Oswego County.

'14 B.S.—L. G. Howell has resigned his position, as teacher of Agriculture in the Springfield, Mass., schools to accept a position with the Office of Farm Management, United States Department of Agriculture, Washington, D. C. This fall he has been doing investigational work for the office in southern New England.

'14 B.S.—H. Branch is working with L.G. Howell in the New England investigational work for the U. S. Dept. of Farm Management.

'14, B.S.—F. W. Lathrop last year's Editor of the CONTRYMAN is teaching agriculture at Canandaigua Academy, one of the thirty-four high schools in the state which are teaching agriculture as a four year course. In connection with this position, Mr. Lathrop does a certain amount of extension work. He was married on Dec. 31, 1914, to Miss Lucy Avery of Groton, Mass.

'14, B.S.—H. A. D. Leggett was married to Ida Savage, sister of Professor Savage on Wednesday, November 25th, at Boston, Mass.

'14, B.S.—Mr. E. D. Vosbury in September, 1914, accepted a position as Scientific Assistant in Fruit Handling and Transportation work in the United States Department of Agriculture, Bureau of Plant Industry, Office of Fruit Handling and Transportation. Mr. Vosbury was first engaged in apple storage investigation at Payette, Idaho and other points in the North West during the fall of 1913. At the present time he is a member of the party headed by Mr. E. L. Markell, engaged in investigations in precooling and handling of fruits and vegetables in Florida.

Ex.-'15,—Clarence F. Morse was married to Miss Wilhelmina Cohn on December twenty-ninth at Portland, Oregon. The bride is the daughter of Mrs. Frank M. Cohn of that city.

MORE POTASH COMING.

American crops and soils are still as hungry for Potash as before the outbreak of the European War, which curtailed the Potash shipments.

Some of the Fertilizer Companies are trying to induce farmers to buy the one-sided low Potash or no Potash fertilizers of a generation ago. This means a fertilizer that is profitable to the manufacturer, but not the best for the farmer. When the Syndicate in 1910 started the direct sales of Potash to dealers and farmers at reasonable prices, Potash sales increased 65 per cent. in one year, a clear proof that farmers know that Potash Pays. They know that Potash gives good yields, good quality and resistance to plant diseases.

Many of the Fertilizer Manufacturers are willing to meet the farmer's wishes and sell him what he thinks he needs. These manufacturers are now willing to furnish as much Potash as they can secure. They offer goods with 5 per cent. and even in some cases 10 per cent. Potash, if the farmers insist on it.

Shipping condtiions are improving, more Potash is coming forward although the costs of production and transportation are higher. The higher price of fertilizers is not due wholly to the slightly higher cost of Potash. Much of the Potash that will be used in next spring's fertilizer had reached America before the war started

There is no substitute for Potash.

We can no more return to the fertilizer of twenty years ago than we can return to the inefficient farm implements or unprofitable live stock of that period.

H. A. HUSTON.

—Adv.

Farmers' Week is Coming!

The Eighth Annual Farmers' Week
will be held at Ithaca

Feb. 8--13, 1915

Exhibits, Demonstrations and Lectures

relating to

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¶ Write to *The Cornell Countryman* for
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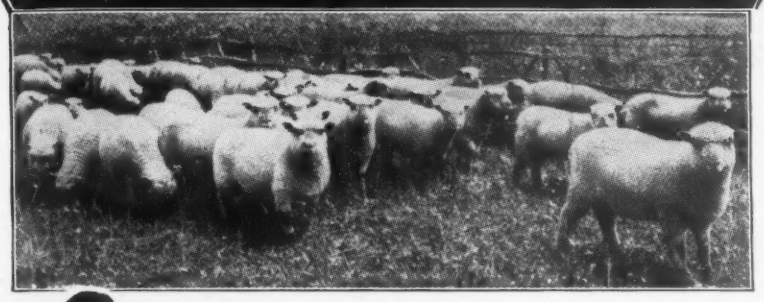
Sheep Thrive Better

(206)



While it is true that no known treatment or remedy will dislodge all the different kinds of worms that infest sheep, it is nevertheless true that SAL-VET will keep sheep in condition to thrive better, and saves hundreds that would otherwise succumb to the multiplying hordes of stomach and intestinal worms.

Mr. J. H. Leet, of Chas. Leet & Sons, Mantua, Ohio, writes: "We consider SAL-VET the salvation of the sheep in America, and we recommend its constant use to our customers, as well as to others."

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Tell me how many head of stock you have and I'll ship you enough SAL-VET—no money down—to feed your stock for 60 days. Simply pay the freight charges on arrival—feed the SAL-VET as directed. If it does not do all I claim I'll cancel the charge and you won't owe me one cent.

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State.....

Sheep..... *Hogs*.....

Cattle..... *Horses*.. .....

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